

User-Level Maintenance (ULM)



Cadre Certification

Welcome



21st TSC
ULM Cadre Certification Course

Introduction

PREREQUISITES

- ✓ **First line supervisor or key person (i.e. Armorer, NBC, Commo representative)**
- ✓ **Have “ULM Certified” on their OF 346**
- ✓ **1 year retainability in 21st TSC**

MAIT

**Maintenance Assistance and
Instruction Team**

Introduction

Purpose

- ✓ **The 21st TSC MAIT conducts the ULM Cadre Certification Course IAW USAREUR Regulation 350-1, USAREUR Supplement 1 to AR 750-1 and the 21st TSC Memorandum of Instruction.**
- ✓ **Cadre train the required ULM certification course for a battalion or separate unit.**

Introduction

Administrative Notes

- ❖ **Class time 0830 - 1630**
- ❖ **Lunch 1200 - 1300**
- ❖ **No more than 2 hours missed**
- ❖ **Latrines**
- ❖ **Snack bar**
- ❖ **Food/Drinks**
- ❖ **Smoking area**
- ❖ **Parking**
- ❖ **Keep class room clean**
- ❖ **Cell Phones and Beepers**

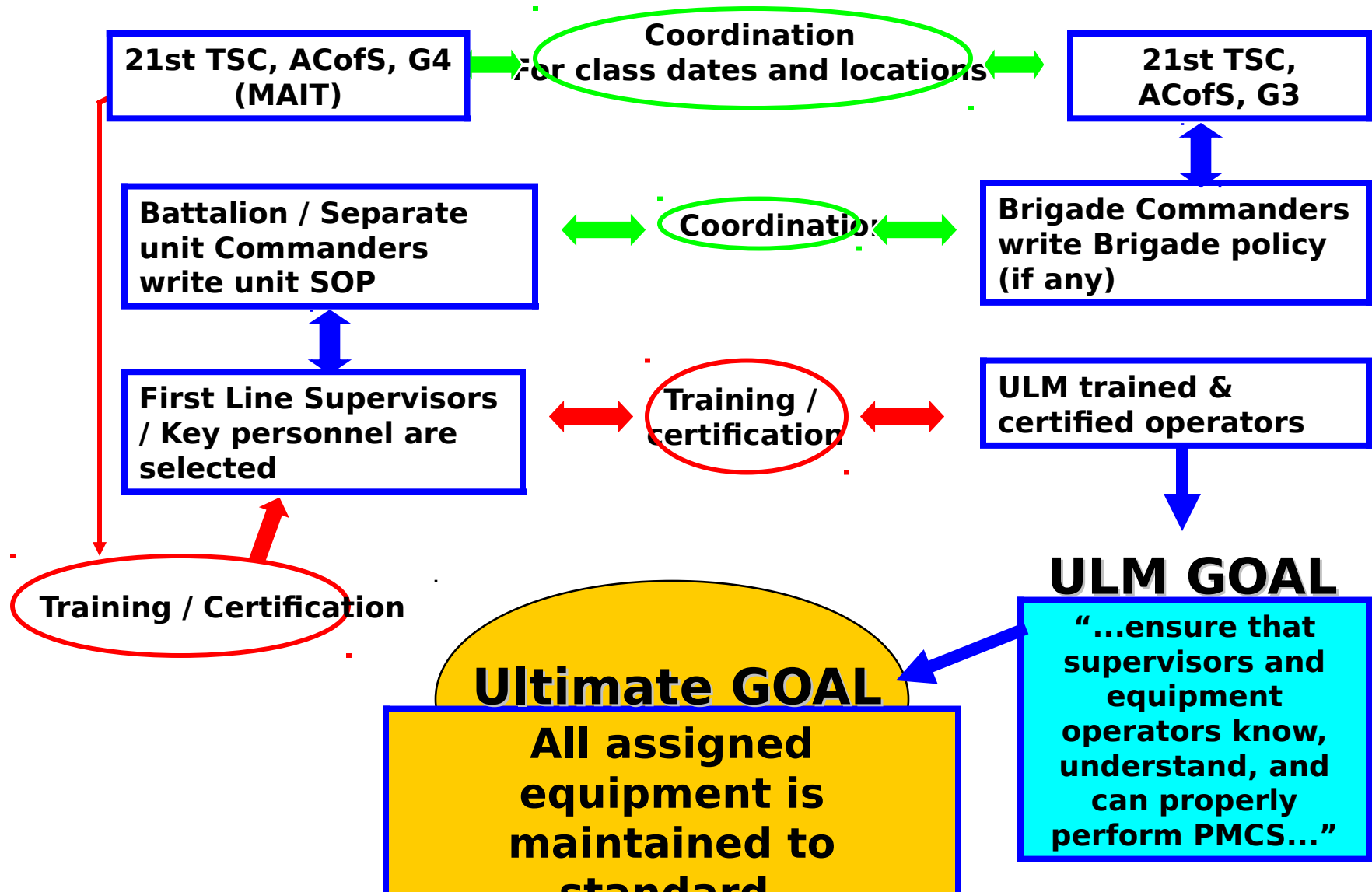
Introduction

21st TSC CG's Policy

“The Army requires PMCS to be performed on all equipment assigned to an organization. Commanders at all levels must stress the importance of performing PMCS. All assigned equipment must be maintained to standard. The Army’s maintenance standard for PMCS is contained in the applicable -10 Technical Manual. Within this command, each battalion/separate company must have a formal ULM Certification training program comprised of MAIT certified instructors, and all personnel must be ULM certified prior to operating assigned equipment”

**USAREUR 350-1 requires User-Level Maintenance (ULM)
Certification Program
21st Theater Support Command**

21st Theater Support Command



Introduction

Objective

**Prepare you to instruct
operator/crew level maintenance
IAW USAREUR and 21st TSC ULM
program directives and guidance.**

**Review Training
Materials and Student
Handouts.**

Introduction

Program References

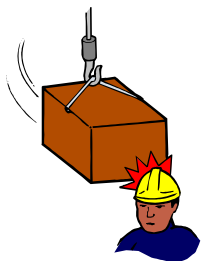
- ✓ **Review USAREUR Regulation 350-1, para 4-4j, User-Level Maintenance Certification Program**
- ✓ **Review 21st TSC MOI - User-Level Maintenance Certification Program**

ULM Certification



?

Time to pretest



Safety

OSHA

EPA

ACCIDENTS ARE

PREVENTABLE!!

The objective/ultimate goal of the Army Safety Program is
..... ***to minimize or eliminate personnel and equipment losses due to accidents.***

RISK
MANAGEMENT

**SAFETY ENHANCES
COMBAT EFFECTIVENESS**

OFF
DUTY
SAFETY

Safety & ULM

Intent:

- ✓ **Raise Overall Awareness**
- ✓ **Review Risk Management**
- ✓ **Review Shop Safety**

Why ?? What play does Safety have during ULM Training / Certification ??

- ✓ **Safety should be the first concern in all that we do.**
- ✓ **Training / Certification will take place in hazard prone areas**

Safety

Three Tier Approach

- **Tier 1 - Commanders Level**
- **Tier 2 - Leader (Supervisory) Level**
- **Tier 3 - Individual Level**

Safety

Commanders Level

- **Set climate for safety**
- **Establish and enforce safety standards**
- **Ensure health and safety of all assigned personnel & equipment**

Safety

Supervisors Level

- **Emphasize adherence to standards**
- **Ensure personnel are fully qualified**
- **Ensure facilities and equipment are properly maintained**
- **Eliminate or control safety hazards**

Safety

Individual Level

- **Comply with written and verbal instructions...perform to standards**
- **Report unsafe or unhealthy conditions and all accidents**
- **Ensure you are properly trained and authorized to operate equipment**

Safety

Human Error

- **Single largest cause of Army accidents**
- **Major factor in training weaknesses -*AND*- not training to standards**

Safety

Human Error

Ground Accident Activity Summary by Accident Type for

MAINTENANCE/REPAIR/SERVICING

October 01 2000 - August 31 2001

Accident Type	A	B	C	D	Total
A (Army Motor Vehicle)	0	<u>1</u>	<u>1</u>	0	2
B (Army Combat Vehicle)	0	0	<u>3</u>	0	3
D (POV-Not on Official Business)	0	0	<u>1</u>	0	1
H (Other Army Vehicle)	0	0	<u>1</u>	<u>1</u>	2
I (Fire)	0	0	<u>2</u>	<u>1</u>	3
O (Personal Injury - Other)	<u>2</u>	<u>3</u>	<u>80</u>	0	85
P (Property Damage - Other)	0	0	<u>7</u>	<u>7</u>	14
	2	4	95	9	110

As of September 03 2001

Count of accidents where at least one person was involved in selected activity

Safety

Human Error

Ground Accident Activity Summary by Accident Type for					
OPERATING VEHICLE OR VESSEL					
October 01 2000 - August 31 2001					
Accident Type	A	B	C	D	Total
A (Army Motor Vehicle)	<u>9</u>	<u>2</u>	<u>107</u>	<u>166</u>	284
B (Army Combat Vehicle)	<u>3</u>	<u>1</u>	<u>11</u>	<u>2</u>	17
C (Army Operated Vehicle)	<u>2</u>	0	<u>10</u>	<u>45</u>	57
D (POV-Not on Official Business)	<u>79</u>	<u>11</u>	<u>153</u>	<u>4</u>	247
F (Marine Underway)	0	0	<u>2</u>	0	2
H (Other Army Vehicle)	<u>1</u>	<u>1</u>	<u>5</u>	<u>10</u>	17
K (Explosive)	0	0	<u>1</u>	0	1
O (Personal Injury - Other)	<u>2</u>	0	<u>8</u>	0	10
P (Property Damage - Other)	0	<u>2</u>	0	<u>1</u>	3
Q (POV - On Official Business)	<u>3</u>	0	<u>1</u>	0	4
	99	17	298	228	642
As of September 03 2001					
Count of accidents where at least one person was involved in selected activity					

Safety

Human Error

Ground Accident Activity Summary by Accident Type for

SUPERVISORY

October 01 2000 - August 31 2001

Accident Type	A	B	C	D	Total
A (Army Motor Vehicle)	<u>3</u>	0	<u>6</u>	<u>4</u>	13
B (Army Combat Vehicle)	<u>2</u>	0	<u>2</u>	<u>1</u>	5
H (Other Army Vehicle)	<u>1</u>	0	<u>1</u>	<u>1</u>	3
K (Explosive)	<u>1</u>	0	0	0	1
O (Personal Injury - Other)	<u>5</u>	0	<u>8</u>	0	13
P (Property Damage - Other)	0	0	<u>1</u>	<u>2</u>	3
	12	0	18	8	38

As of August 30 2001

Count of accidents where at least one person was involved in selected activity

Safety

Human Error

All AMV System Hazards

Count of 2759 Mistakes made by individuals involved in Class A - D Accidents

Hazards	#of	Percentage
Failed To Stay Alert Or Attentive To What Was Happening	<u>463</u>	<u>17%</u>
Failed To Take Appro Precautions For Adverse Enviro Conditions	<u>265</u>	<u>10%</u>
Failed To Ensure Adequate Clearance/Space For Operation	<u>185</u>	<u>7%</u>
Excessive Speed	<u>173</u>	<u>6%</u>
Following Too Close For Enviro Conditions Or Veh Speed/Design	<u>136</u>	<u>5%</u>
Misjudged Clearance (Improperly Estimated/Evaluated)	<u>130</u>	<u>5%</u>
Failed To Use Required Safety Equipment/Device/Guard/Sign	<u>109</u>	<u>4%</u>
Failed To Yield Right-Of-Way (Other Than While Turning)	<u>82</u>	<u>3%</u>
Excessive For Road/Weather Conditions	<u>79</u>	<u>3%</u>
Improperly/Failed To Lock/Block/Secure (I.E., Load)	<u>63</u>	<u>2%</u>

Safety

Human Error

Sources of Human Error in Army Accidents

Human error causes 80% of all Army accidents (materiel failure 15% and environmental-related conditions 5%). Accident studies trace human error accidents to one or more of the following:

Source	Description
Individual--48%	Soldier knows and is trained to standard but elects not to follow standard (self-discipline) for any of the following reasons: Attitude Haste Alcohol, drugs Overconfidence Fatigue (self-induced)
Leader--18%	Leader does not enforce known standard.
Training--18%	Soldier not trained to known standard (insufficient, incorrect, or not trained on task.)
Standard--8%	Standards or procedures are not clear or practical or do not exist.
Support--8%	Equipment or materiel is improperly designed or not provided. Inadequate maintenance, facilities, or services.

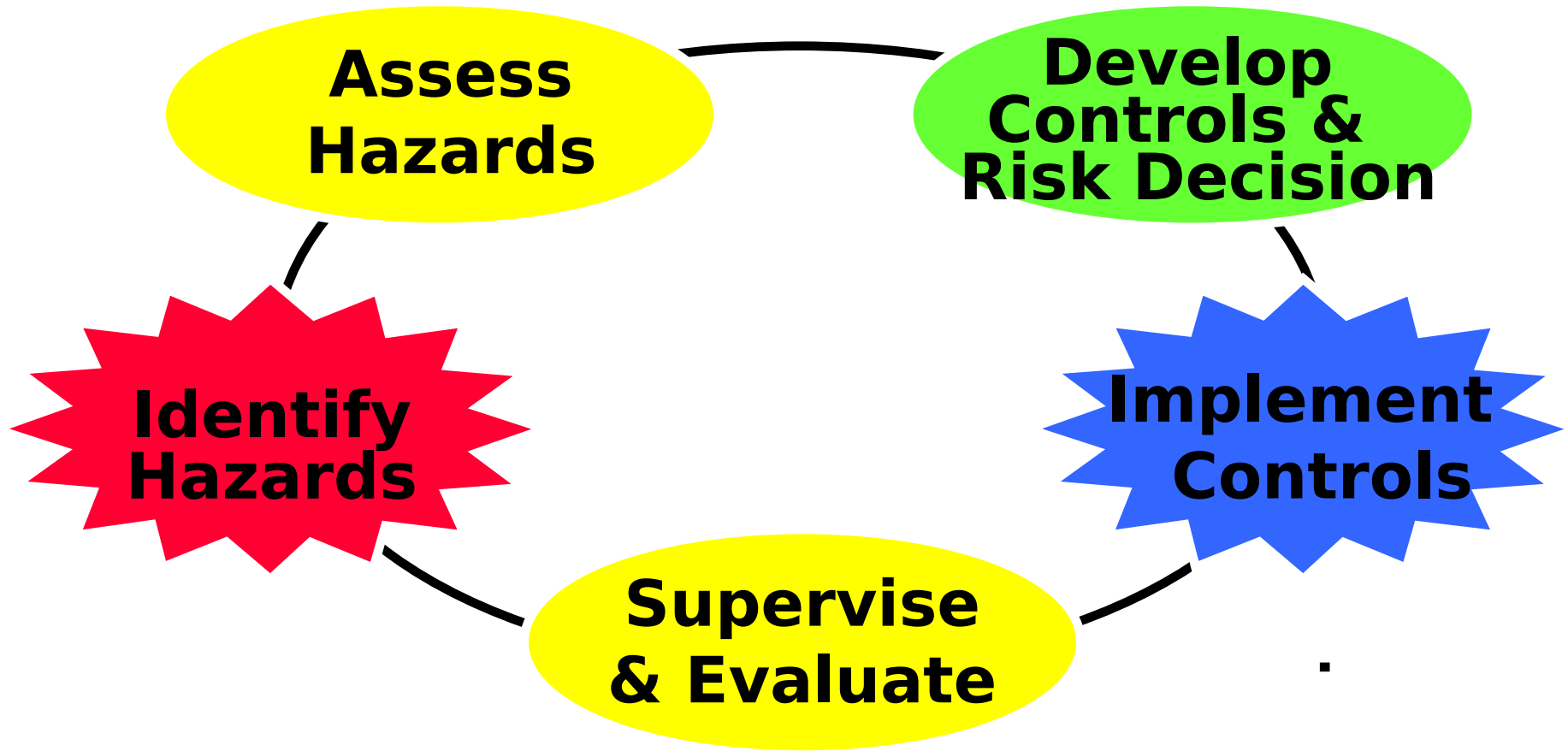
Safety

Risk Management

- **Tool to protect the force...identifies hazards and associated risks**
- **Simple 5-step process**

Safety

Risk Management Process



Safety Risk Management

Risk Management Matrix

Matrix			HAZARD PROBABILITY				
			Frequent	Likely	Occasional	Seldom	Unlikely
			A	B	C	D	E
SEVERITY	Catastrophic	I	EXTREMELY HIGH		HIGH		
	Critical	II	HIGH	HIGH			
	Marginal	III		MODERATE		LOW	
	Negligible	IV					

Safety Risk Management

Risk Management Matrix

Matrix			HAZARD PROBABILITY				
			Frequent	Likely	Occasional	Seldom	Unlikely
			A	B	C	D	E
SEVERITY	Catastrophic	I	EXTREMELY HIGH		HIGH		
	Critical	II	HIGH	HIGH			
	Marginal	III		MODERATE		LOW	
	Negligible	IV					

Safety Risk Management

RISK ASSESSMENT MATRIX

Determine
the severity
category.

SEVERITY	HAZARD PROBABILITY				
	Frequent A	Likely B	Occasional C	Seldom D	Unlikely E
Catastrophic	Death or permanent total disability, system loss, or major property damage.				
Critical	Permanent, partial disability or temporary total disability in excess of 3 months, major system damage, or significant property damage.				
Marginal	Minor injury, lost workday accident, minor system damage, or minor property damage.				
Negligible	First aid or minor medical treatment or minor system impairment.				

RISK MANAGEMENT

The process of identifying and controlling hazards to protect the force. It is applicable to any mission and environment.

Hazard Risk-Assessment Code

Risk Level

IA-IB, IIA

EXTREMELY HIGH

IC-ID, IIB-IIC, IIIA

HIGH

IE, IID, IIIB-IIIC, IVA

MODERATE

IIIE, IIID-IIIE, IVB-IVE

LOW

Safety Risk Management

Risk Management Matrix

			HAZARD PROBABILITY				
			Frequent	Likely	Occasional	Seldom	Unlikely
			A	B	C	D	E
SEVERITY	Catastrophic	I	EXTREMELY HIGH	HIGH		MODERATE	
	Critical	II	HIGH	HIGH		MODERATE	LOW
	Marginal	III	MODERATE	MODERATE		LOW	
	Negligible	IV	LOW	LOW		LOW	

Safety Risk Management

RISK ASSESSMENT MATRIX

Determine the probability category.

			HAZARD PROBABILITY				
			Frequent	Likely	Occasional	Seldom	Unlikely
SEVERITY	Catastrophic	I	Occurs often; continuously experienced.	Occurs several times.	Occurs sporadically.	Unlikely, but could occur at some time.	Can assume it will not occur.
	Critical	II					
	Marginal	III					
	Negligible	IV					

RISK MANAGEMENT

The process of identifying and controlling hazards to protect the force. It is applicable to any mission and environment.

Hazard Risk-Assessment Code

Risk Level

IA-IB, IIA

EXTREMELY HIGH

IC-ID, IIB-IIC, IIIA

HIGH

IE, IID, IIIB-IIIC, IVA

MODERATE

IIIE, IIID-IIIE, IVB-IVE

LOW

Safety Risk Management

Practical Exercise:

**Conduct this
ULM Certification Course:**

- **Identify the hazards**
- **Select one Hazard, assess that hazard and develop controls**

Safety Risk Management

Risk Management Matrix

Matrix			HAZARD PROBABILITY				
			Frequent	Likely	Occasional	Seldom	Unlikely
			A	B	C	D	E
SEVERITY	Catastrophic	I	EXTREMELY HIGH		HIGH		
	Critical	II	HIGH	HIGH			
	Marginal	III		MODERATE		LOW	
	Negligible	IV					

Safety

Vehicle / Equipment Safety

- **Occupational Safety & Health Administration**
- **AR/USAREUR Regulations 385-55**
Prevention of Motor Vehicle Accidents
- **Army in Europe (AE) Pamphlet 385-15**
Leaders Operational Accident-Prevention Guide
- **21st TSC Circular 385-01**
Safety and Occupational Health Program
- **Technical Manuals, Technical Bulletins and Lubrication Orders also provide detailed safety information on equipment.**

Safety

Eye wash: Common Faults

- **Not inspected / flushed / cleaned weekly**
- **Eyesaline Solution not annotated/expiration**
- **Empty**
- **Not marked / lighted**
- **Blocked**

Safety

Tire Maintenance

- AR 750-1, para 4-45, Maintenance of Pneumatic Tires
d.(1) All commanders will ensure that training will be provided to **all individuals who service single-piece or multi-piece rims and wheels used on large vehicles.** These individuals will demonstrate proficiency in their ability to perform specific tire, rim, and wheel tasks. Individual ability to perform these tasks will be evaluated and **a record maintained documenting this evaluation.**

Safety

Tire Maintenance: Common Faults

- **Personnel not trained**
- **Cage not in use**
- **Cage not approved**
- **Cage bolted down**
- **Cage not inspected before use**
- **OSHA charts missing**
- **Improper hose and inflation gage**

Safety

Fire Prevention: Common Faults

- **Fire extinguishers overdue inspections, not at designated points, improper type**
- **Exits blocked, not marked, locked**
- **Fuel stored in common areas, unapproved containers, open containers, etc.**
- **Smoking in maintenance areas & buildings**
- **Combustible rags uncovered, trash not emptied, etc.**

Safety

Grounding: Common Faults

- **Fuelers parked w/o being grounded**
- **Maintenance being performed on fuelers w/o being grounded**
- **Generators being PMCS'd and operated w/o being grounded**

Safety

Personal Protective Equipment

What is PPE ??

- **Eye protection**
- **Hearing protection**
- **Skin protection**

Safety

Personal Protective Equipment: Common Faults

- **Personnel not trained**
- **MSDS not available**
- **Not used**
- **Improperly used**
- **Improper PPE**

Safety

Miscellaneous: Common Faults

- **Wheels not chocked**
- **Support Legs not utilized**
- **Improper equipment**
- **Vehicles blocking exits**
- **Jacks & Stands not load tested, inspected or not used**
- **Jewelry and loose clothing**
- **Tripping hazards (General Housekeeping)**
- **All Jacks not load tested / inspected**

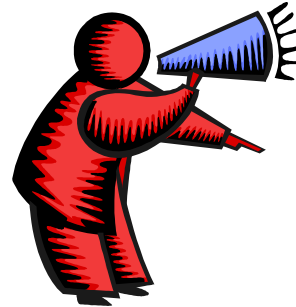
Safety



**Smokin
g in
shop
areas ?**



**Eye
Protecti
on ?**



**Hearing
Protecti
on ?**



**Personal
Protectiv
e
Equip ?**

Symptoms of something wrong in the management system occur because of people's faults (*Human Error*) but more importantly because of the defects that exist in the system (*Unit Programs*).

Safety

Practical Exercise:

**Identify shop safety hazards in the next
two slides**









Safety

**The Life, Limb and Pain you save
may be your own !!**

Questions ??

Safety

21st TSC Safety POC

Mr. Wolsiffer

DSN 484-7318

FAX 484-8152

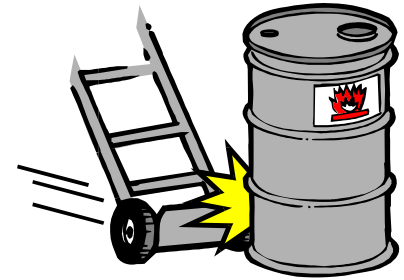
Email:

**reinhardt.wilsiffer@hq.21tsc.ar
my.mil**

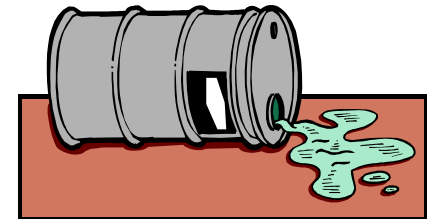
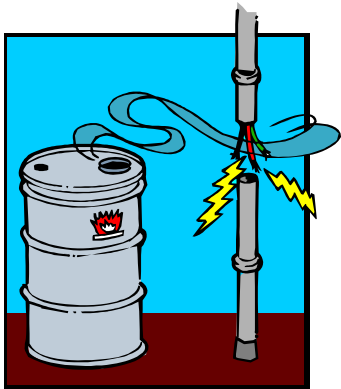
Hazardous Communication (HAZCOM) Program



HAZCOM



**You have the
right to know!**



HAZCOM & ULM

Intent:

- ✓ **Raise Overall Awareness**
- ✓ **Review Regulatory Requirements**
- ✓ **Review Material Safety Data Sheets (MSDS)**

Why ?? **What play does HAZCOM have during ULM Training / Certification ??**

- ✓ **Subject to be exposed to HAZMAT during PMCS hands-on training / certification.**
- ✓ **Training / Certification will take place**

Hazardous Materials Communication Program (HAZCOM)

Purpose

To ensure “Soldiers and civilians who work with or may be exposed to hazardous chemicals or materials will have access to information on chemicals used in the workplace”.

**Reference USAREUR Regulation 385-10, Safety ,
Implementation of Hazard Communication
Standard**

Hazardous Materials Communication Program (HAZCOM)

Applicability of the Army's HAZCOM Program

Applies to all Department of the Army Personnel who have potential on-the-job exposure to hazardous chemicals. This applies to full time, part time, temporary, and voluntary personnel.

Does not apply to:

Contract employees at Government Owned Contractor Operated (GOCO) are covered by their own HAZCOM programs.

Hazardous Materials Communication Program (HAZCOM)

Regulatory Requirements for HAZCOM

- **Occupational Safety & Health Administration**
Title 29, Code of Federal Regulations (CFR), Part 1910.1200, Hazard Communication Standard.
- **DODI 6050.5, Hazard Communication Program**
- **AR 700-141 Hazardous Materiel Information System**
- **AR 385-10 The Army Safety Program**
- **UR 385-10 Implementation of Hazard Communication Standard**

HAZCOM

BY LAW Employees Must Be:

- ✓ **Informed** of the hazardous materials in the work place
- ✓ **Trained** to work safely with these materials
- ✓ **Aware** of where to find information about the hazardous materials

HAZCOM

Hazard Communication Standard Goals:

- **Minimize injuries and illnesses caused by hazardous materials in the work place**
- **Identify and evaluate chemical hazards**
- **Establish uniform requirements for informing employees of hazardous materials**

HAZCOM

The Chain of Command Must:

- **Ensure labeling of hazardous materials**
- **Provide employees with information and training**
- **Maintain chemical inventory**
- **Maintain written HAZCOM program**

HAZCOM

Material Safety Data Sheets (MSDS):

- The MSDS is a document which describes the physical and chemical properties of products, their physical and health hazards, and precautions for safe handling and use.
- A MSDS *must be maintained for each hazardous chemical* on the chemical inventory.
- All employees must know where MSDS's are located and have access throughout the work period.
- EM 0003 & EM 0004

HAZCOM

MSDS

Regardless of the format, the HAZCOM Standard (29 CFR 1910.1200 g) requires the following information:

Chemical Identity & Company Information

Hazardous Ingredients

Physical and Chemical Characteristics

Physical Hazards

Health Hazards

Special Precautions

Control Measures

Emergency and First Aid

Reactivity Information

**Chemical Identity--
chemical, trade, and
common name(s).
Responsible Party--
name, address and
telephone number of
the party responsible
for preparing or
distributing the
MSDS.**

SECTION 1

CHEMICAL IDENTITY & COMPANY INFORMATION

DAVIS PETROLEUM SERVICES -- ANTIFREEZE, ETHYLENE GLYCOL, INHIBITED, HEAVY

MSDS Safety Information

FSC: 6850NIIN: 01-441-3223

MSDS Date: 11/01/1998

MSDS Num: CJMFP

Product ID: ANTIFREEZE, ETHYLENE GLYCOL, INHIBITED, HEAVY DUTY MFN: 01

Responsible Party Cage: 0VTU2Name: DAVIS PETROLEUM SERVICES

Address: 3520 WEST 69TH ST SUITE 203City: LITTLE ROCK AR 72209

Info Phone Number: 501-565-0035

Emergency Phone Number: 501-565-0035

Resp. Party Other MSDS No.: 051.N6

HAZCOM

MSDS

*Chemical Identity &
Company
Information*

Hazardous Ingredients

*Physical and
Chemical
Characteristics*

Physical Hazards

Health Hazards

Special Precautions

Control Measures

Emergency and First

**Hazardous
Ingredients--any
physical hazard
ingredients must be
listed; carcinogens
must be listed if they
are present at levels
of 0.1% or greater
and; any non-
carcinogenic health
hazards that are**

**present at levels of
1% or greater must**

SECTION 2

HAZARDOUS INGREDIENTS

**Cas: 107-21-1 RTECS #:
KW2975000**

Name: ETHYLENE GLYCOL

% low Wt: 90.% high Wt: 95.

**Other REC Limits: NONE
RECOMMENDED**

OSHA PEL: NONE

**KNOWN ACGIH TLV: NOT
ESTABLISHED**

**ACGIH STEL: C127 MG/M3; C50
PPM**

EPA Rpt Qty: 1 LB

DOT Rpt Qty: 1 LB---

**Cas: 111-46-6 RTECS #:
ID5950000**

**Name: DIETHYLENE GLYCOL %
low Wt: 0.% high Wt: 5. Other**

REC Limits: NONE

**RECOMMENDED OSHA PEL:
NONE**

KNOWN ACGIH TLV: 25 PPM

HAZCOM

MSDS

*Chemical Identity &
Company Information*

*Hazardous
Ingredients*

**Physical and
Chemical
Characteristics**

Physical Hazards

Health Hazards

Special Precautions

Control Measures

*Emergency and First
Aid*

**Physical and
Chemical
Characteristics--
general appearance
and odor; boiling
and freezing points;
density; vapor
pressure; specific
gravity; solubility
and; volatility.**

SECTION 3

CHEMICAL DATA

HCC: V5

Boiling Point: =203.3C, 398.F

Vapor Pres: 0.4

Vapor Density: 2.1(AIR=1)

Spec Gravity: 1.12(WATER=1)

VOC Pounds/Gallon: 9.3

PH: 9 TO 11.5

**Appearance and Odor: GREEN. MILD
ODOR**

Percent Volatiles by Volume: 97.0

HAZCOM

MSDS

*Chemical Identity &
Company Information*

*Hazardous
Ingredients*

*Physical and
Chemical
Characteristics*

Physical Hazards

Health Hazards

Special Precautions

Control Measures

*Emergency and First
Aid*

**Physical Hazards--
conditions under which
the hazardous material
could ignite or
explode; recommended
extinguishing agents
and fire fighting
methods; chemical
incompatibilities, and;
decomposition
products**

SECTION 4

PHYSICAL HAZARD DATA

Flash Point Method: TCC

Flash Point: =118.3C, 245.F

Flash Point Text: LOWEST COMPONENT

Autoignition Temp: =398.9C, 750.F

Lower Limits: 1.5

Extinguishing Media: NFPA CLASS B EXTINGUISHERS. FOR CLASS III B LIQUID FIRES (DRY CHEMICAL, FOAM,OR CARBON DIOXIDE(CO2)).

Fire Fighting Procedures: WATER SPRAY MAY BE INEFFECTIVE ON FIRE BUT CAN PROTECT FIRE FIGHTERS & COOLCLOSED CONTAINERS. USE FOG NOZZLES IF WATER IS USED. DO NOT ENTER CONFINED FIRE-SPACE WITHOUT FULL BUNKER GEAR. (HELMET W/FAC E SHIELD, BUNKER COATS,GLOVES & RUBBER BOOTS). USE NIOSH APPROVED POSITIVE-PRESSURE SELF-CONTAINED BREATHING APPARATUS.

Unusual Fire/Explosion Hazard: KEEP CONTAINER TIGHTLY CLOSED. ISOLATE FROM OXIDIZERS, HEAT, & OPEN FLAME. CLOSED CONTAINERS MAY EXPLODE. IF EXPOSED TO EXTREME HEAT. APPLYING TO HOT SURFACE REQUIRES SPECIAL PRECAUTIONS. EMPTY CONTAINER VERY HAZARDOUS. FOLLOW ALL LABEL PRECAUTIONS.

HAZCOM

MSDS

*Chemical Identity &
Company Information*

*Hazardous
Ingredients*

*Physical and
Chemical
Characteristics*

Physical Hazards

Health Hazards

Special Precautions

Control Measures

*Emergency and First
Aid*

**Health Hazards--includes
carcinogenicity,
corrosiveness, toxicity,
irritation, sensitization,
teratogenicity, and target
organ effects such as
liver, kidney, and lung;
route of entry; the OSHA
PEL and ACGIH TLV.**

SECTION 5

HEALTH HAZARD DATA HEALTH EFFECTS

(Acute and Chronic)

LD50 LC50 Mixture: LD50 (ORAL, RAT) 5,810 MG/KG

Carcinogenicity Inds - NTP: NO

IARC: NO

OSHA: NO

Effects of Exposure: TARGET ORGANS: EYES, SKIN, RESPIRATORY SYSTEM, CNS (). CONTACT: OF ACUTE OVEREXPOSURE - PRIMARY IRRITATION TO SKIN, DERMATITIS. PRIMARY IRRITATION TO EYES, REDNESS, TEARING, BLURRED VISION. ABSORPTION THRU SKIN INCREASES EXPOSURE. SWALLOWING: HARMFUL OR FATAL IF SWALLOWED. SWALLOWING MAY CAUSE ABDOMINAL IRRITATION, NAUSEA, VOMITING AND DIARRHEA. ORGANIC EFFECTS EYE AND SKIN CONTACT: OF CHRONIC OVEREXPOSURE: LIQUID CAUSES EYE IRRITATION. WASH THOROUGHLY AFTER HANDLING.

Explanation Of Carcinogenicity: THIS PRODUCT HAS NO CARCINOGENS LISTED BY IARC, NTP, NIOSH, OSHA OR ACGIH AS OF THIS DATE, GREATER OR EQUAL TO 0.1%.

HAZCOM

MSDS

Chemical Identity &
Company Information

Hazardous
Ingredients

Physical and
Chemical
Characteristics

Physical Hazards

Health Hazards

Special Precautions

Control Measures

Emergency and First
Aid

Precautions for safe
handling and use
during spill, leak and
clean-up procedures;
precautions to be
taken during
maintenance and
repair of equipment;
EPA waste and
disposal methods,
and, state and local
requirements.

SECTION 6

SPILL OR LEAK PROCEDURES

Spill Release Procedures: SMALL: MOP UP WITH ABSORBENT MATERIAL AND TRANSFER TO HOOD. LARGE: ISOLATE FROM OXIDIZERS, HEAT AND OPEN FLAME. PERSONS WITHOUT PROPER PROTECTION SHOULD BE KEPT OUT UNTIL CLEANED UP.

Waste Disposal Methods: SMALL: EVAPORATE UNTIL ALL VAPORS ARE GONE. DISPOSE OF REMAINDER BY LEGALLY APPLICABLE METHODS. LARGE: RECYCLE OR INCINERATE OBSERVING LOCAL, STATE AND FEDERAL HEALTH, SAFETY AND POLLUTION.

Handling And Storage Precautions: STORE LARGE AMOUNTS IN STRUCTURE MADE FOR OSHA CLASS OTHER LIQUIDS. AVOID FREE FALL OF LIQUIDS. GROUND CONTAINERS WHEN TRANSFERRING.

Other Precautions: DO NOT CUT, BRAZE OR WELD. EMPTY CONTAINER VERY HAZARDOUS! FOLLOW ALL LABEL PRECAUTIONS. AVOID PROLONGED OR REPEATED BREATHING OF VAPORS OR SPRAY MIST. DO NOT GET IN EYES, ON SKIN OR CLOTHING. DO NOT TAKE INTERANALLY. ORGANIC EFFECTS: EYE AND SKIN

HAZCOM

MSDS

*Chemical Identity &
Company Information*

*Hazardous
Ingredients*

*Physical and
Chemical
Characteristics*

Physical Hazards

Health Hazards

Special Precautions

Control Measures

*Emergency and First
Aid*



**Control Measures--
personal protective
equipment,
engineering
controls, and work
practice controls.**

SECTION 7

EXPOSURE CONTROL INFORMATION

Respiratory Protection: VENTILATE TO KEEP AIR BELOW 45 PPM. IF OVER TLV, IN ACCORDANCE WITH 29 CFR (SPECIFIC TYPE) 1910.134, USE A NIOSH APPROVED POSITIVE-PRESSURE SELF-CONTAINED BREATHING APPARATUS.

Ventilation: LOCAL EXHAUST NECESSARY. MECHANICAL (GENERAL) ACCEPTABLE. SPECIAL: NONE.

Protective Gloves: IMPERVIOUS GLOVES

Eye Protection: STANDARD GOGGLES OF FACE SHIELD.

Other Protective Equipment: WEAR OSHA STANDARD GOGGLES OF FACE SHIELD. CONSULT SAFETY EQUIPMENT SUPPLIER. WEAR GLOVES, APRON & FOOTWEAR IMPERVIOUS TO THIS MATERIAL.

Work Hygienic Practices: WASH CLOTHING BEFORE REUSE.

For OSHA Standards visit www.osha.gov

HAZCOM

MSDS

*Chemical Identity &
Company Information*

Hazardous Ingredients

*Physical and Chemical
Characteristics*

Physical Hazards

Health Hazards

Special Precautions

Control Measures

**Emergency and First
Aid**

Reactivity Information

**Emergency and
First Aid
Procedures--
actions to be
taken in case of
accidental
overexposure.**

SECTION 8

EMERGENCY FIRST AID PROCEDURES

First Aid: IN CASE OF CONTACT WITH SKIN, FLUSH WITH PLENTY OF WATER. FOR EYES, FLUSH WITH PLENTY OF WATER FOR 15 MINUTES AND GET MEDICAL ATTENTION. AFTER HIGH VAPOR EXPOSURE, REMOVE TO FRESH AIR. IF BREATHING IS DIFFICULT, GIVE OXYGEN. IF BREATHING HAS STOPPED, GIVE ARTIFICIAL RESPIRATION. IF SWALLOWED, CALL A PHYSICIAN IMMEDIATELY. INDUCE VOMITING PROMPTLY FOLLOWING PHYSICIAN'S INSTRUCTIONS OR BY HAVING PATIENT STICK FINGER DOWN THROAT. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

HAZCOM

MSDS

Chemical Identity

*Hazardous
Ingredients*

*Physical and
Chemical
Characteristics*

Physical Hazards

Health Hazards

Special Precautions

Control Measures

*Emergency and First
Aid*

Reactivity

■

**Reactivity Data,
Conditions to
avoid,
Decomposition
information.**

■

SECTION 9

STABILITY AND REACTIVITY

Stability Indicator: YES

Stability Condition To Avoid: ISOLATE FROM OXIDZERS, HEAT, & OPEN FLAME

Materials To Avoid: ISOLATE FROM STRONG OXIDIZERS SUCH AS PERMANGANTES, CHROMATES & PEROXIDES.

Hazardous Decomposition Products: CARBON MONOXIDE, CARBON DIOXIDE FROM BURNING.

Hazardous Polymerization Indicator: NO Conditions

To Avoid Polymerization: MATERIAL IS NOT KNOWN TO POLYMERIZE.

Toxicological Information

KNOWN ORAL LD50 (ORAL, RAT) 5840 MG/KG (107-21-1);

LOWEST KNOWN SKIN LD50 (SKIN, RABBIT) 9530 MG/KG (107-21-1).

THE LETHAL DOSE IN HUMANS IS ESTIMATED TO BE 100 ML (3 OUNCES).

HAZCOM

PAINTING:

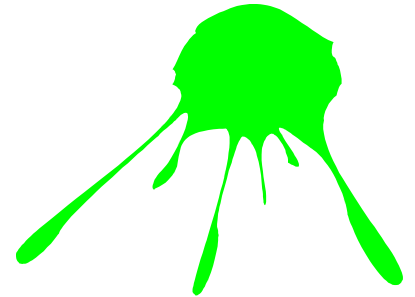
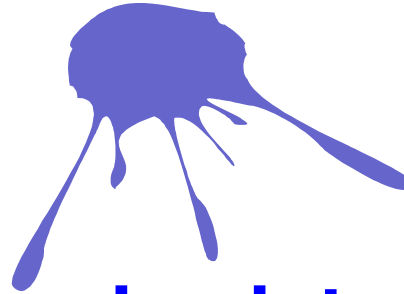
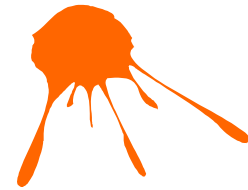
Brush and Roller:

For oil and solvent based paints, *including* single component CARC paint

☠ Hazards = vapor, skin irritation

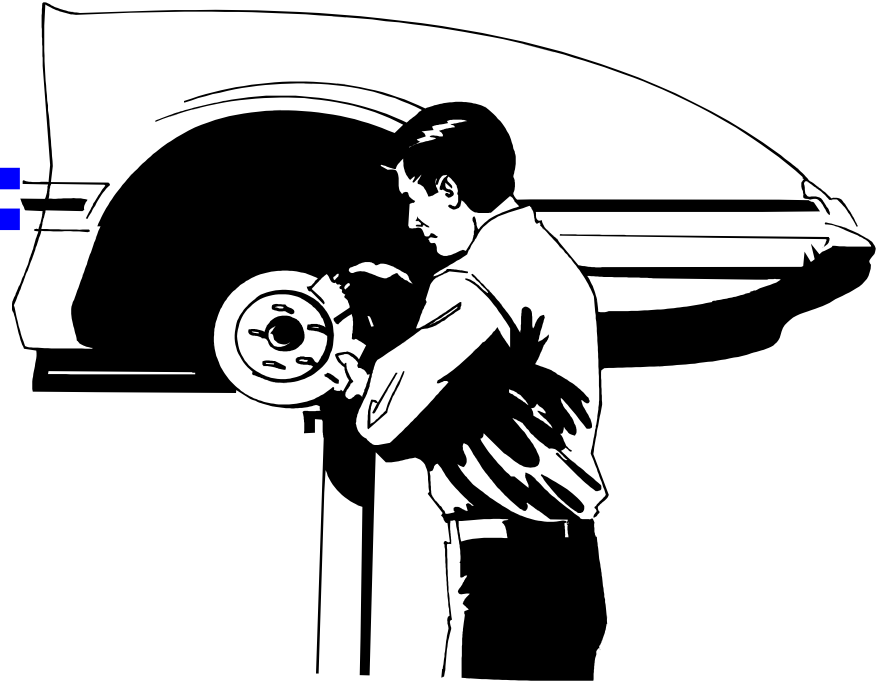
😊 Solution = good ventilation, skin protection

For brush and roller painting with dual component CARC paint, contact your industrial hygienist for guidance



HAZCOM

BRAKE WORK:



- ☠ Hazard = Potential for asbestos exposure
- 😊 Solution = wet method

HAZCOM

WELDING:



☠ Hazards = smoke, fumes, UV light, sparks

😊 Solution = eye protection, insulated gloves, leather apron, adequate ventilation

HAZCOM

BATTERY FILLING AND DRAINING:

- ☠ Hazard = acid/chem splash
- 😊 Solution = rubber gloves, rubber apron, rubber boots, goggles, face shield

BATTERY CHARGING:

- ☠ Hazard = hydrogen gas
- 😊 solution = good ventilation



HAZCOM

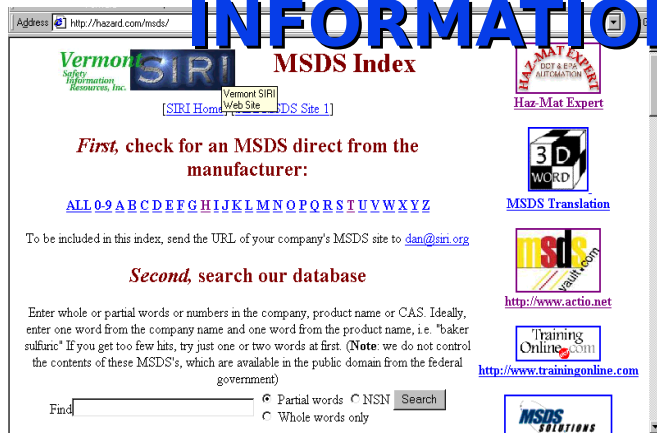
FUELS HANDLING:



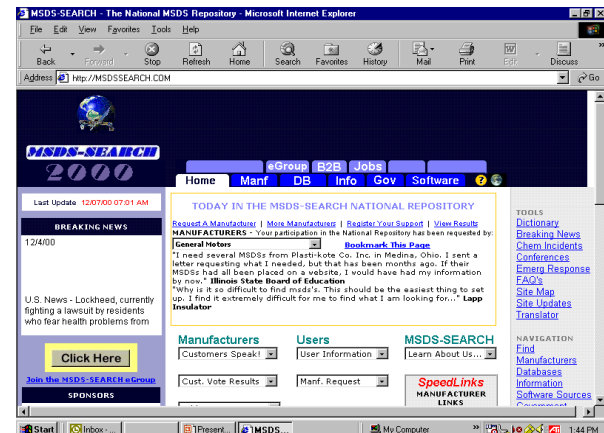
☠ Hazard = solvent vapor, possible skin irritation

😊 Solution = good ventilation, potential need for skin and eye protection

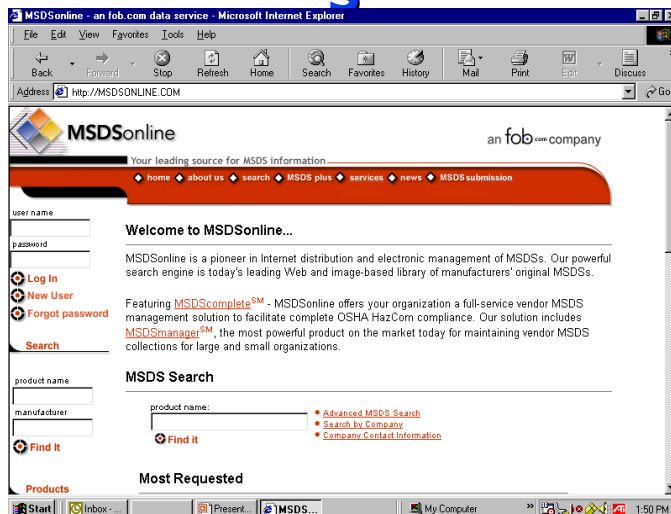
MSDS RESOURCES PUBLICATIONS & EM 0003 & EM 0004 WEB SITES WITH MSDS INFORMATION



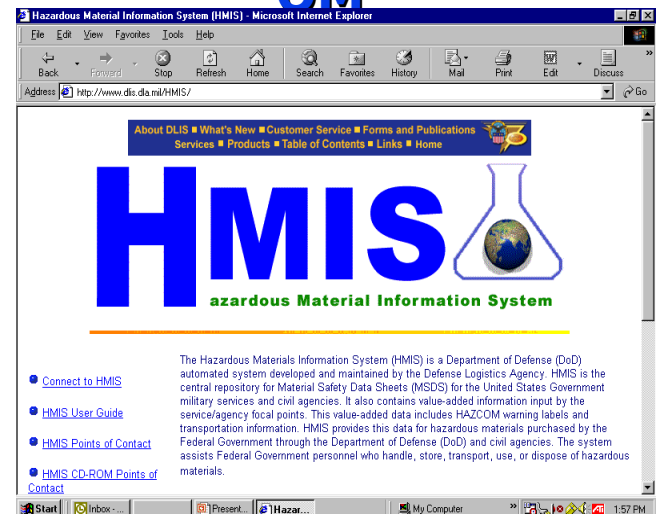
HTTP://HAZARD.COM/MSDS



HTTP://WWW.MSDSSEARCH.COM



HTTP://WWW.MSDSONLINE.CO



HTTP://WWW.DLIS.DLA.MIL/HM

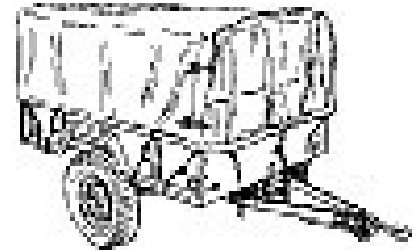
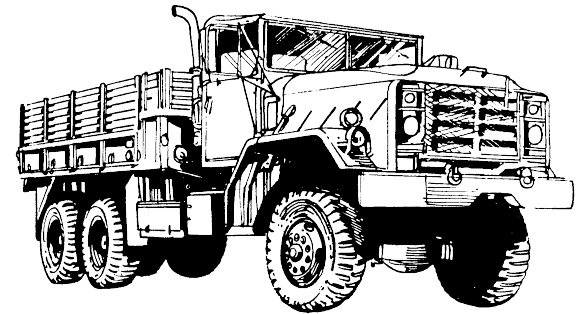
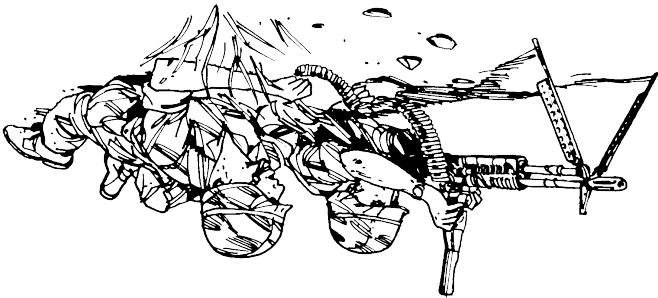
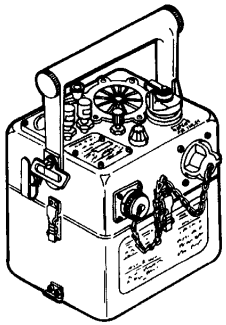
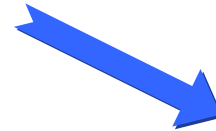
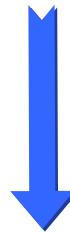
Hazardous Materials Communication Program (HAZCOM)

21st TSC POC's
Mr. Dauterman

DSN 484-7312

FAX DSN 484-8663/7142

Publications



Publications & ULM

Intent:

- ✓ **Briefly Review Regulatory References**
- ✓ **Review a typical Operators Manual**
- ✓ **Review other related publications**

Why ?? What play do Publications have on ULM Training / Certification ??

- ✓ **Must understand regulatory requirements and standards**
- ✓ **Must train from the manuals to meet the standards**

Publications Overview

- **Army and USAREUR Regulations incl, Supplement and Pam**

Publications Related to PMCS

- ✓ **Army and USAREUR Regulations incl, Supplement and Pam**
- **Technical Manual (TM)**
 - **PMCS Tables**
 - **Troubleshooting Tables**
 - **Lubrication Instructions**
 - **Maintenance Allocation Charts**

Publications Related to PMCS

- ✓ **Army and USAREUR Regulations incl, Supplement and Pam**
- ✓ **Technical Manual (TM)**
 - **PMCS Tables**
 - **Troubleshooting Tables**
 - **Lubrication Instructions**
 - **Maintenance Allocation Charts**
- **Technical Bulletin (TB)**

Publications Related to PMCS

- ✓ **Army and USAREUR Regulations incl, Supplement and Pam**
- ✓ **Technical Manual (TM)**
 - **PMCS Tables**
 - **Troubleshooting Tables**
 - **Lubrication Instructions**
 - **Maintenance Allocation Charts**
- ✓ **Technical Bulletin (TB)**
- **Standing Operating Procedures (SOP)**

Publications Related to PMCS

- ✓ **Army and USAREUR Regulations incl, Supplement and Pam**
- ✓ **Technical Manual (TM)**
 - **PMCS Tables**
 - **Troubleshooting Tables**
 - **Lubrication Instructions**
 - **Maintenance Allocation Charts**
- ✓ **Technical Bulletin (TB)**
- ✓ **Standing Operating Procedures (SOP)**
- **Publications Resources**

Publications

Army and USAREUR Regulations

- **AR/UR Sup 750-1, Army Materiel Maintenance Policy and Retail Maintenance Operations**

Publications

Army and USAREUR Regulations

- ✓ AR/UR Sup 750-1, Army Materiel Maintenance Policy and Retail Maintenance Operations
- ***DA Pam 738-750, Functional Users Manual for the Army Maintenance Management System (TAMMS)**

**** Use is required by AR 750-1 hence, procedures contained in this reference is REGULATORY !***

Publications

Army and USAREUR Regulations

- ✓ **AR/UR Sup 750-1, Army Materiel Maintenance Policy and Retail Maintenance Operations**
- ✓ ***DA Pam 738-750, Functional Users Manual for the Army Maintenance Management System (TAMMS)**
- ***DA Pam 750-35, Guide For Motor Pool Operations**
**** Use is required by AR 750-1 hence, procedures contained in this reference is REGULATORY !***

Publications

Army and USAREUR Regulations

- ✓ **AR/UR Sup 750-1, Army Materiel Maintenance Policy and Retail Maintenance Operations**
- ✓ ***DA Pam 738-750, Functional Users Manual for the Army Maintenance Management System (TAMMS)**
- ✓ ***DA Pam 750-35, Guide For Motor Pool Operations**

➤ ***FM 4-30.3 (Replaced FM 43-5). Maintenance Operations and Procedures**
Use is required by AR 750-1 hence, procedures contained in this reference is
REGULATORY !

Publications

Army and USAREUR Regulations

- ✓ **AR/UR Sup 750-1, Army Materiel Maintenance Policy and Retail Maintenance Operations**
- ✓ ***DA Pam 738-750, Functional Users Manual for the Army Maintenance Management System (TAMMS)**
- ✓ ***DA Pam 750-35, Guide For Motor Pool Operations**
- ✓ ***FM 4-30.3 (Replaced FM 43-5), Maintenance Operations and Procedures**
- **AR/UR 385-55, Prevention of Motor Vehicle Accidents**

Publications

Army and USAREUR Regulations

- ✓ **AR/UR Sup 750-1, Army Materiel Maintenance Policy and Retail Maintenance Operations**
- ✓ ***DA Pam 738-750, Functional Users Manual for the Army Maintenance Management System (TAMMS)**
- ✓ ***DA Pam 750-35, Guide For Motor Pool Operations**
- ✓ ***FM 4-30.3 (Replaced FM 43-5), Maintenance Operations and Procedures**
- ✓ **AR/UR 385-55, Prevention of Motor Vehicle Accidents**
- **DA Pam 750-1, Leaders Unit Maintenance Handbook**

Publications

Technical Manuals (TM's)

Publications

TM number Explanation

The Equipment Manual (TM, LO, MWO, etc,) numbers are the same

TM 9-2320-280-10
LO 9-2320-280-12
MWO 9-2320-280-xxx

The basic number indicating the general type of equipment (9 = Ordnance, most vehicles)

TM 9-2320-280-10

The second set of numbers (four digits) represent the Federal Supply Class (FSC)

The third set of numbers (three digits) represents the sequence number that is assigned to the publication and indicates the type of equipment it pertains to.

Publications

TM number Explanation

The fourth set of number (two digits) represents the level of maintenance it pertains to.

TM 9-2320-280-10



- **10** **Crew/Operator**
- **20** **Organizational (unit mechanics)**
- **30** **Direct Support**
- **40** **General Support**
- **50** **Depot Support**

Examples:

12 = Crew/Operator and Organizational Maintenance

23 = Organizational and Direct Support Maintenance

13 = Crew/Operator, Organizational and Direct Support Maintenance

Publications

TM Suffix codes

The suffix code indicates the contents of the manual.



TM 9-2320-280-20**P**

- TM 9-2320-280-24_ = Maintenance only
- TM 9-2320-280-24**P** = **Parts** only
- TM 9-2320-280-24**&P** = Maintenance and **Parts**
- TM **9-2320-280-10HR** = Hand Receipts

Examples:

13&P = Crew/Operator, Organizational, and Direct Support Maintenance **and** **Parts**

24P = Organizational, Direct Support, and General Support, **Parts Only**

Publications

Crew/operator technical manuals provide operational and technical information.

How well do you know your HMMWV capabilities ??

Open TM 9-2320-280-10

Publications

TM 9-2320-280-10

Changes

Publications

TM 9-2320-280-10

Changes

Chapter 1, “INTRODUCTION”

➤ Sec I - General Information

Publications

TM 9-2320-280-10

Changes

Chapter 1, “INTRODUCTION”

- ✓ **Sec I - General Information**
- **Sec II - Equipment Description**

Publications

TM 9-2320-280-10

Changes

Chapter 1, “INTRODUCTION”

- ✓ **Sec I - General Information**
- ✓ **Sec II - Equipment Description**

Chapter 2, “OPERATING INSTRUCTIONS”

- **Sec I - Description and Use of Operator's Controls**

Publications

TM 9-2320-280-10

Changes

Chapter 1, “INTRODUCTION”

- ✓ **Sec I - General Information**
- ✓ **Sec II - Equipment Description**

Chapter 2, “OPERATING INSTRUCTIONS”

- ✓ **Sec I - Description and Use of Operator's Controls**
- **Sec II - Preventive Maintenance Checks and Services**

Publications

The equipment operator must conduct the PMCS in a particular sequence. The number under the “ITEM NO” column gives the PMCS sequence.

Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	<u>Crewmember</u> Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
- 10	Before	Fire Extinguisher	<u>DRIVER</u> a. Check for missing or damaged fire extinguisher. b. Check gauge for proper pressure of about 150 psi (1034 kPa). c. Check for damaged or missing seal.	a. Fire extinguisher missing or damaged. b. Pressure gauge needle in recharge area. c. Seal broken or missing.

Publications

The “**INTERVAL**” column shows the frequency an item is to be checked or serviced. The intervals may be B (before operations), D (during operations), A (after operations), W (weekly), and M (monthly)



Item No.	Interval	Location	<u>Crewmember</u> Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
- 10	Before	Fire Extinguisher	<u>DRIVER</u> a. Check for missing or damaged fire extinguisher. b. Check gauge for proper pressure of about 150 psi (1034 kPa). c. Check for damaged or missing seal.	a. Fire extinguisher missing or damaged. b. Pressure gauge needle in recharge area. c. Seal broken or missing.

Publications

The “**LOCATION/ITEM TO CHECK/SERVICE**” column provides information on locating the item to be checked or serviced.

Table 2-2. *Preventive Maintenance Checks and Services (Cont'd)*

Item No.	Interval	Location	<u>Crewmember</u> Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
- 10	Before	Fire Extinguisher	<u>DRIVER</u> a. Check for missing or damaged fire extinguisher. b. Check gauge for proper pressure of about 150 psi (1034 kPa). c. Check for damaged or missing seal.	a. Fire extinguisher missing or damaged. b. Pressure gauge needle in recharge area. c. Seal broken or missing.

Publications

The “CREWMEMBER PROCEDURE” column provides information on specific checks.

Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	<u>Crewmember</u> Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
- 10	Before	Fire Extinguisher	<u>DRIVER</u> a. Check for missing or damaged fire extinguisher. b. Check gauge for proper pressure of about 150 psi (1034 kPa). c. Check for damaged or missing seal.	a. Fire extinguisher missing or damaged. b. Pressure gauge needle in recharge area. c. Seal broken or missing.

Publications

The “NOT FULLY MISSION CAPABLE IF” column explains the condition that must exist on the checked or serviced item to render the equipment not mission capable (NMC)

Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	<u>Crewmember</u> Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
- 10	Before	Fire Extinguisher	<u>DRIVER</u> a. Check for missing or damaged fire extinguisher. b. Check gauge for proper pressure of about 150 psi (1034 kPa). c. Check for damaged or missing seal.	a. Fire extinguisher missing or damaged. b. Pressure gauge needle in recharge area. c. Seal broken or missing.

Publications

TM 9-2320-280-10

Chapter 2, “OPERATING INSTRUCTIONS”

- ✓ **Sec I - Description and Use of Operator's Controls**
- ✓ **Sec II - Preventive Maintenance Checks and Services**
- **Sec III - Operation Under Usual Conditions**
- **Sec IV - Operation Under Unusual Conditions**
- **Sec V - Cargo/Troop Carrier and S250 Shelter Carrier Operation**
- **Sec VI - TOW/Armament Carrier Operation**
- **Sec VII - Ambulance Operation**

Publications

TM 9-2320-280-10

Chapter 3, “MAINTENANCE INSTRUCTIONS”

➤ Sec I - Lubrication

Publications

TM 9-2320-280-10

Chapter 3, “MAINTENANCE INSTRUCTIONS”

- ✓ **Sec I - Lubrication**
- **Sec II - Troubleshooting**

Publications

Troubleshooting table

- **Published in the unit -10 TM**
- **Primary tool for troubleshooting faults found during operator/crew PMCS**
- **Provides a systematic procedure for determining corrective actions for faults found**
- **Provides instructions that will help the operator identify and correct simple vehicle malfunctions**

Publications

Troubleshooting table

TM 9-2320-280-10

Table 3-1. Troubleshooting (Cont'd)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
BRAKES		
15. POOR SERVICE BRAKING ACTION		
All causes.		Notify unit maintenance.
16. SERVICE BRAKES DRAGGING		
All causes.		Notify unit maintenance.
17. BRAKE WARNING LAMP ASSEMBLY ON		
Step 1. Check to see if parking brake is partially applied.		Disengage parking brake.
Step 2. Check for low brake fluid level (TM 9-2320-280-20).		Add brake fluid (Appendix G).
Step 3. Other causes.		Notify unit maintenance.
18. PARKING BRAKE FAILS TO HOLD VEHICLE		
Clean and adjust parking brake (para. 3-13)		If parking brake still fails to hold vehicle, notify unit maintenance.

Publications

Troubleshooting table

TM 9-2320-280-10

Table 3-1. Troubleshooting (Cont'd)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
BRAKES		
15. POOR SERVICE BRAKING ACTION	<u>All causes.</u>	Notify unit maintenance.
16. SERVICE BRAKES DRAGGING	All causes.	Notify unit maintenance.
17. BRAKE WARNING LAMP ASSEMBLY ON	Step 1. Check to see if parking brake is partially applied. Disengage parking brake. Step 2. Check for low brake fluid level (TM 9-2320-280-20). Add brake fluid (Appendix G). Step 3. Other causes. Notify unit maintenance.	
18. PARKING BRAKE FAILS TO HOLD VEHICLE	Clean and adjust parking brake (para. 3-13) If parking brake still fails to hold vehicle, notify unit maintenance.	

Publications

Troubleshooting table

TM 9-2320-280-10

Table 3-1. Troubleshooting (Cont'd)

MALFUNCTION	
TEST OR INSPECTION	
CORRECTIVE ACTION	
BRAKES	
15. POOR SERVICE BRAKING ACTION	
All causes.	Notify unit maintenance.
16. SERVICE BRAKES DRAGGING	
All causes.	Notify unit maintenance.
17. BRAKE WARNING LAMP ASSEMBLY ON	
Step 1. Check to see if parking brake is partially applied.	Disengage parking brake.
Step 2. Check for low brake fluid level (TM 9-2320-280-20).	Add brake fluid (Appendix G).
Step 3. Other causes.	Notify unit maintenance.
18. PARKING BRAKE FAILS TO HOLD VEHICLE	
Clean and adjust parking brake (para. 3-13)	If parking brake still fails to hold vehicle, notify unit maintenance.

Publications

TM 9-2320-280-10

Chapter 3, “MAINTENANCE INSTRUCTIONS”

- ✓ **Sec I - Lubrication**
- ✓ **Sec II - Troubleshooting**
- **Sec III - Maintenance Procedures**

Publications

Maintenance Procedures

- **Published in the unit -10 TM**
- **Provides maintenance instructions for operator / crew.**

Publications

TM 9-2320-280-10

➤ Appendix A, “REFERENCES”

Publications

TM 9-2320-280-10

- ✓ **Appendix A, “REFERENCES”**
- **Appendix B, “COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS (BII)”**

Publications

TM 9-2320-280-10

- ✓ **Appendix A, “REFERENCES”**
- ✓ **Appendix B, “COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS (BII)”**
- **Appendix C, “ADDITIONAL AUTHORIZATION LIST”**

Publications

TM 9-2320-280-10

- ✓ **Appendix A, “REFERENCES”**
- ✓ **Appendix B, “COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS (BII)”**
- ✓ **Appendix C, “ADDITIONAL AUTHORIZATION LIST”**
- **Appendix D, “EXPENDABLE/DURABLE SUPPLIES AND MATERIAL”**

Publications

TM 9-2320-280-10

- ✓ **Appendix A, “REFERENCES”**
- ✓ **Appendix B, “COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS (BII)”**
- ✓ **Appendix C, “ADDITIONAL AUTHORIZATION LIST”**
- ✓ **Appendix D, “EXPENDABLE/DURABLE SUPPLIES AND MATERIAL”**
- **Appendix E, “STOWAGE AND SIGN GUIDE”**

Publications

TM 9-2320-280-10

- ✓ **Appendix A, “REFERENCES”**
- ✓ **Appendix B, “COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS (BII)”**
- ✓ **Appendix C, “ADDITIONAL AUTHORIZATION LIST”**
- ✓ **Appendix D, “XPENDEABLE/DURABLE SUPPLIES AND MATERIAL”**
- ✓ **Appendix E, “STOWAGE AND SIGN GUIDE”**
- **Appendix F, “ON-VEHICLE EQUIPMENT LOADING PLANS”**

Publications

TM 9-2320-280-10

- ✓ **Appendix A, “REFERENCES”**
- ✓ **Appendix B, “COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS (BII)”**
- ✓ **Appendix C, “ADDITIONAL AUTHORIZATION LIST”**
- ✓ **Appendix D, “EXPENDABLE/DURABLE SUPPLIES AND MATERIAL”**
- ✓ **Appendix E, “STOWAGE AND SIGN GUIDE”**
- ✓ **Appendix F, “ON-VEHICLE EQUIPMENT LOADING PLANS”**
- **Appendix G, “LUBRICATION INSTRUCTIONS”**

Publications

TM 9-2320-280-10

Lubrication Instructions

- **Also known as Lubrication Orders (LO's)**
- **Provides Lubrication Requirements**
 - **Intervals**
 - **Type lubricant**
 - **Picture diagrams of *Lubrication Points* and “blow-up” picture diagrams of *Localized Lubrication Points***

Publications

TM 9-2320-280-10

Lubrication Instructions

Intervals

- **D = Daily**
- **W = Weekly (every 7 days)**
- **M = Monthly (every 4th week)**

Publications

TM 9-2320-280-10

Lubrication Instructions

Intervals

- **C/MR = Change gear lubricant only when required by maintenance repair action, or if contaminated by water or other foreign materials**
- **3/S = 3,000 miles (4,800 km) or semiannually (6 months), whichever occurs first**

Publications

TM 9-2320-280-10

Lubrication Instructions

Intervals

- **6/A = 6,000 miles (9,600 km) or annually which-ever occurs first**
- **12/B = 12,000 miles (19,200 km) or biannually (24 months), whichever occurs first**

Publications

Lubrication Table

USAGE	FLUID/LUBRICANT	CAPACITIES	EXPECTED TEMPERATURES
Engine Oil (MIL-L-2104) (MIL-L-46167)	OE/HDO 30 OE/HDO 10 OEA	Crankcase: w/o filter 7 qt (6.6 L) w/ filter 8 qt (7.6 L) Dry System 10 qt (9.5 L)	Above +15° F (-9° C) +40° to -15° F (+4° to -26° C) +40° to -65° F (+4° to -54° C)
Engine Coolant	Ethylene Glycol and Water 1/4 Ethylene Glycol, 3/4 Water 2/5 Ethylene Glycol, 3/5 Water 3/5 Ethylene Glycol, 2/5 Water	Radiator: 5 qt (4.7 L) Complete System: 26 qt (24.6 L)	Above +15° F (-9° C) +40° to -15° F (+4° to -26° C) +40° to -65° F (+4° to -54° C)
Transmission (3L80)	Dexron® II or Dexron® III	Dry 11 qt (10.4 L) Drain & Refill 6 qt (5.7 L)	All Temperatures (except arctic)
(4L80-E)	Dexron® III	Dry 13.5 qt (12.8 L) Drain & Refill 7.7 qt (7.3 L)	All Temperatures (except arctic)
	OEA		Arctic Temperatures

Example

Publications

Lubrication Table (cont)

USAGE	FLUID/LUBRICANT	CAPACITIES	EXPECTED TEMPERATURES
Steering System	Dexron® II or Dexron® III	1 qt (0.95 L) w/Cooler 1.25 qt (1.18 L)	All Temperatures
Upper Ball Joints (all vehicles), Lower Ball Joints (A2 and M1123 vehicles only), Tie Rod Ends, Pitman Arm, Propeller Shafts, etc.	GAA	As Required	All Temperatures
Hinges, Cables, and Linkages	OE/HDO	As Required	All Temperatures
OE/HDO 15W-40 (Grade 15W-40) lubricant may be used when expected temperatures are above +5°F (-15°C). If OEA lubricant is required to meet the temperature ranges prescribed in the Lubrication Table, then the OEA lubricant is to be used in place of OE/HDO 10 lubricant for all temperature ranges. If operating conditions are severe or abnormal, service chassis lubrication points at 1,000 mi (1,609 km).			

Change 1 G-3

Example

Publications

Lubrication Table (cont)

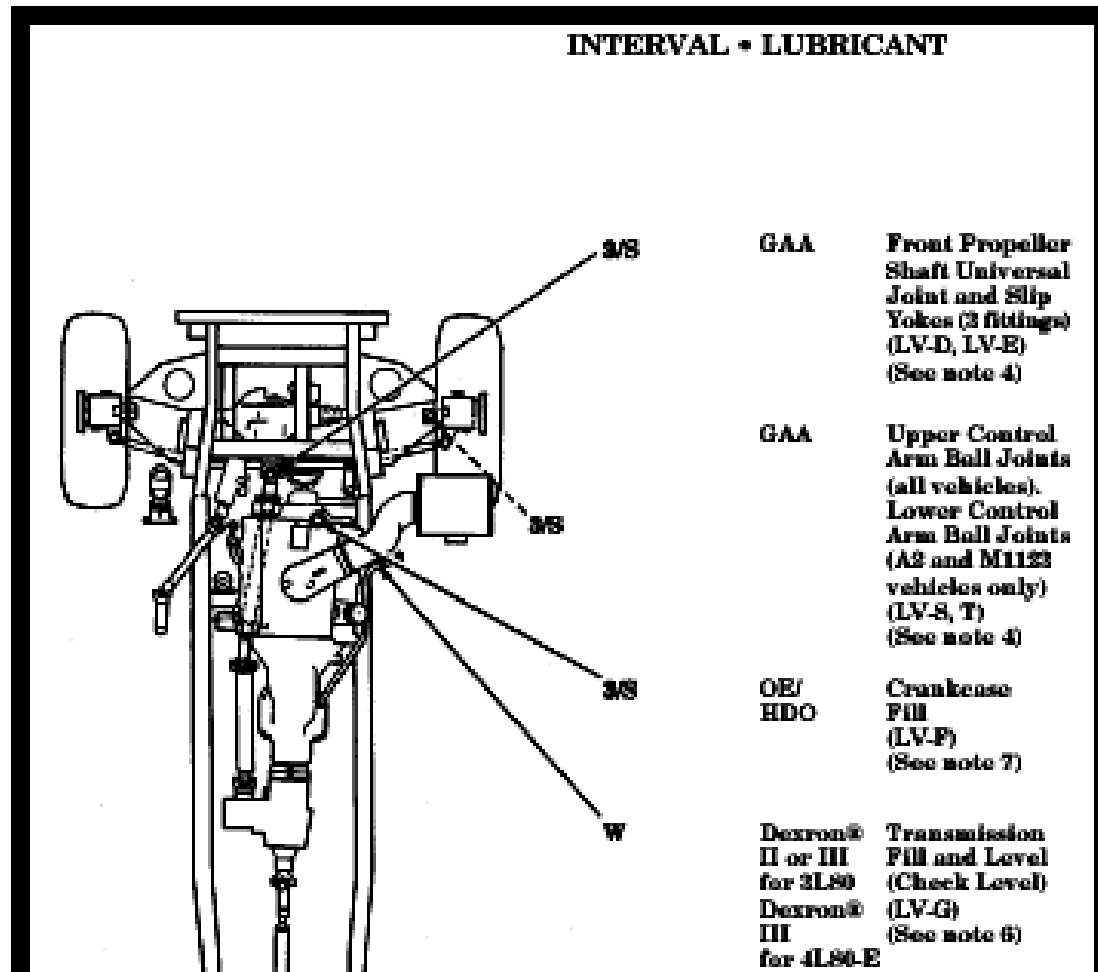
Table G-1. Lubrication (Cont'd)

LUBRICANTS	EXPECTED TEMPERATURES
GAA-GREASE, AUTOMOTIVE AND ARTILLERY (MIL-G-10924)	ALL TEMPERATURES
PL-S-LUBRICATING OIL, GENERAL PURPOSE, PRESERVATIVE, (WATER DISPLACING LOW TEMPERATURE) (VV-L-800A)	ALL TEMPERATURES
GWR-GREASE, WIRE ROPE (MIL-G-18458)	ALL TEMPERATURES
FUEL REQUIREMENTS — TEMPERATURE LIMITS (VV-F-800) Grade DF2 Fuel For use above +10°F (-12°C)* Grade DF1** For use below +10°F (-12°C) to above -20°F (-29°C) Grade DFA For use below -20°F (-29°C) * Temperature limits may vary dependent on the cloud point of the actual DF2 fuel being supplied in the geographical area. ** DF1 is not normally procured in CONUS or OCONUS. Refineries will blend DF2 with kerosene to meet temperature requirements of DF1.	

Example

Publications

Lubrication Points



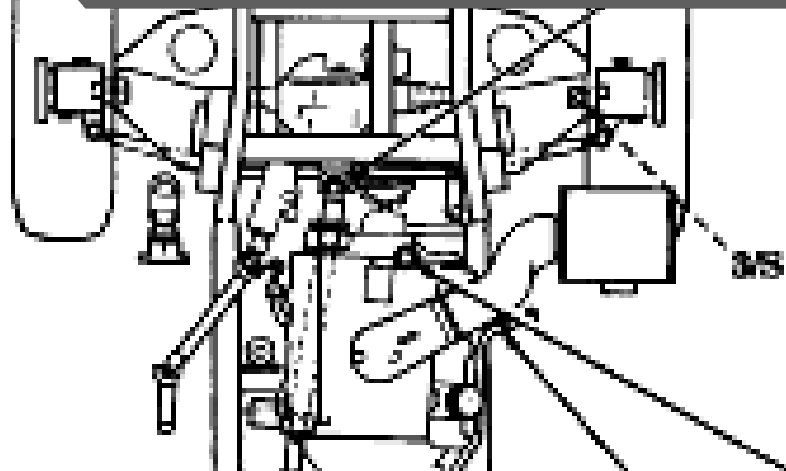
Example

Publications

Lubrication Points

INTERVAL • LUBRICANT

Item/location, note and level of maintenance (depending on the lubrication order)



**Front Propeller
Shaft Universal
Joint and Slip
Yokes (3 fittings)
(LV-D, LV-E)
(See note 4)**

GAA

**Upper Control
Arm Ball Joints
(all vehicles).
Lower Control
Arm Ball Joints
(A2 and M1123
vehicles only)
(LV-S, T)
(See note 4)**

Publications

Lubrication Points

INTERVAL • LUBRICANT

**Type of
lubricant**

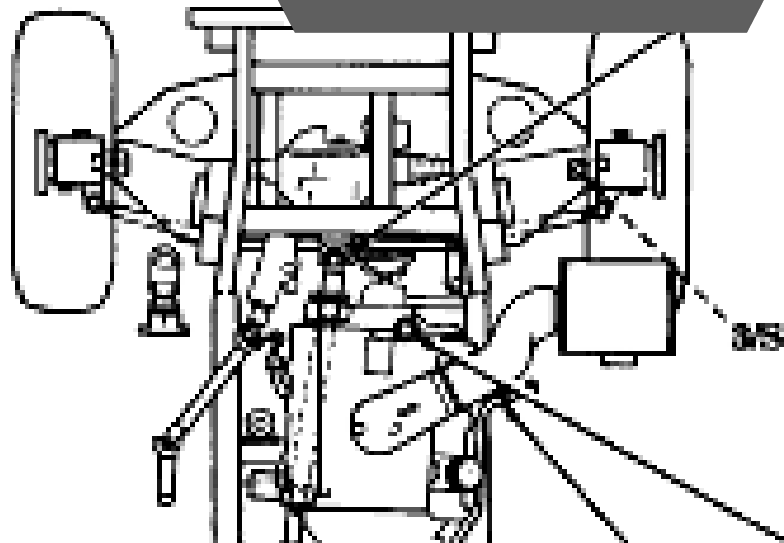


GAA

Front Propeller
Shaft Universal
Joint and Slip
Yokes (3 fittings)
(LV-D, LV-E)
(See note 4)

GAA

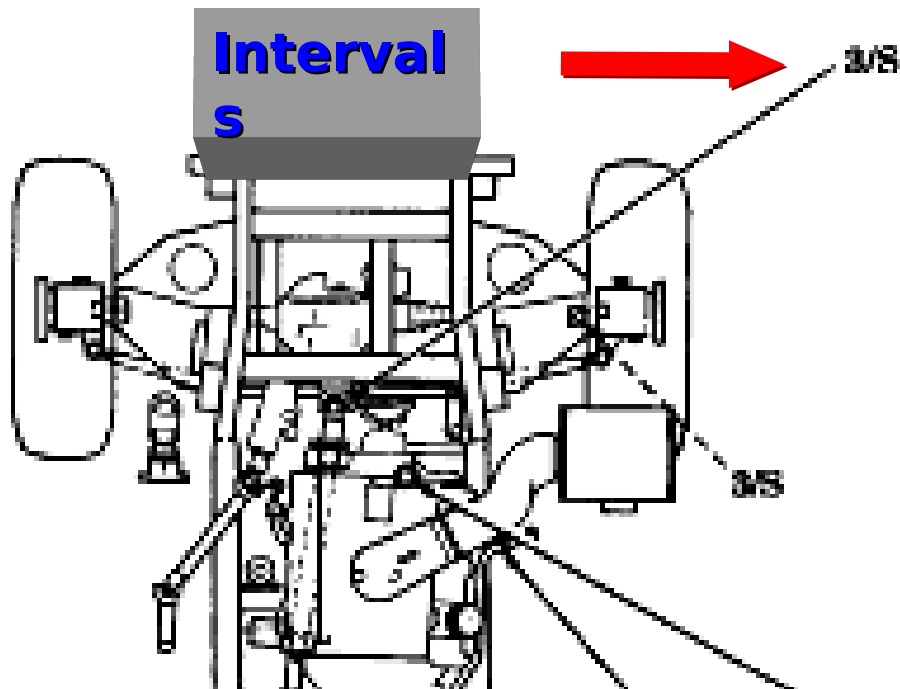
Upper Control
Arm Ball Joints
(all vehicles).
Lower Control
Arm Ball Joints
(A2 and M1123
vehicles only)
(LV-8, T)
(See note 4)



Publications

Lubrication Points

INTERVAL • LUBRICANT



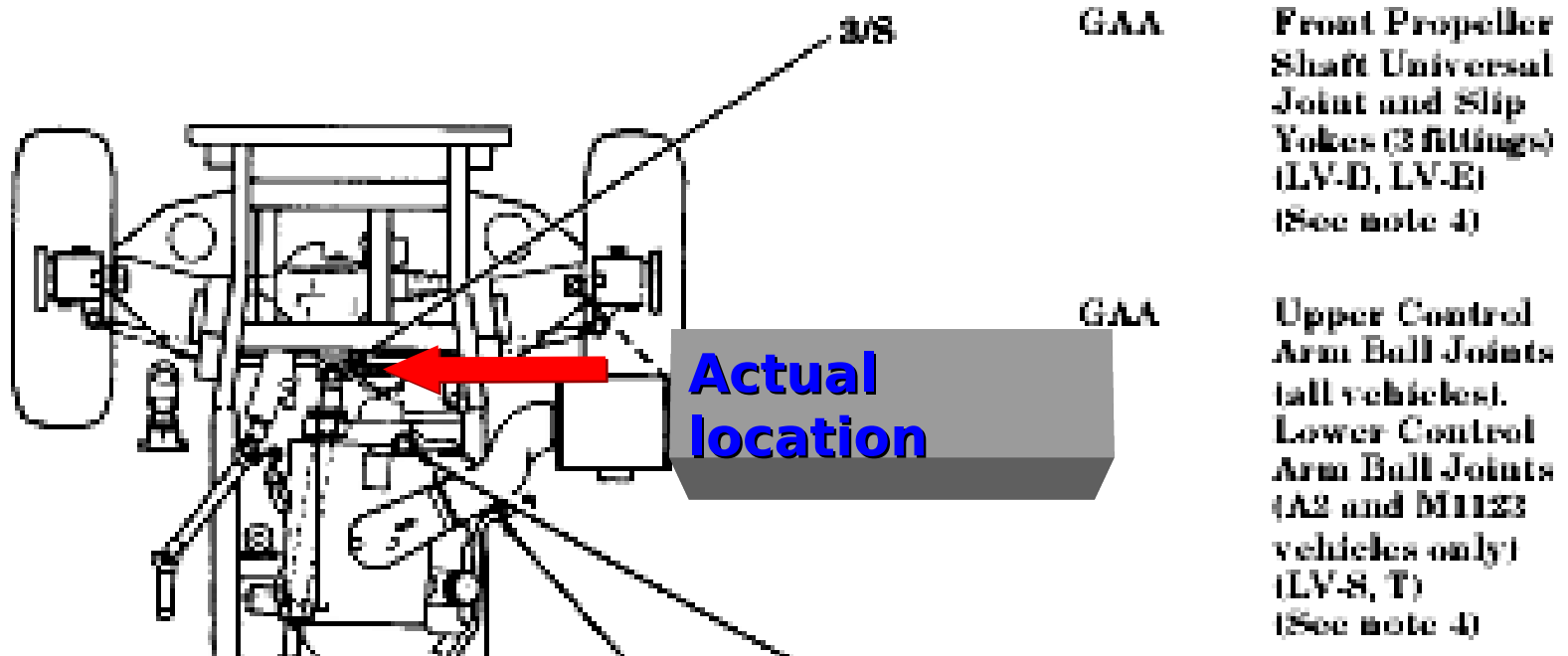
GAA Front Propeller
Shaft Universal
Joint and Slip
Yokes (3 fittings)
(LV-D, LV-E)
(See note 4)

GAA Upper Control
Arm Ball Joints
(all vehicles).
Lower Control
Arm Ball Joints
(A2 and M1123
vehicles only)
(LV-S, T)
(See note 4)

Publications

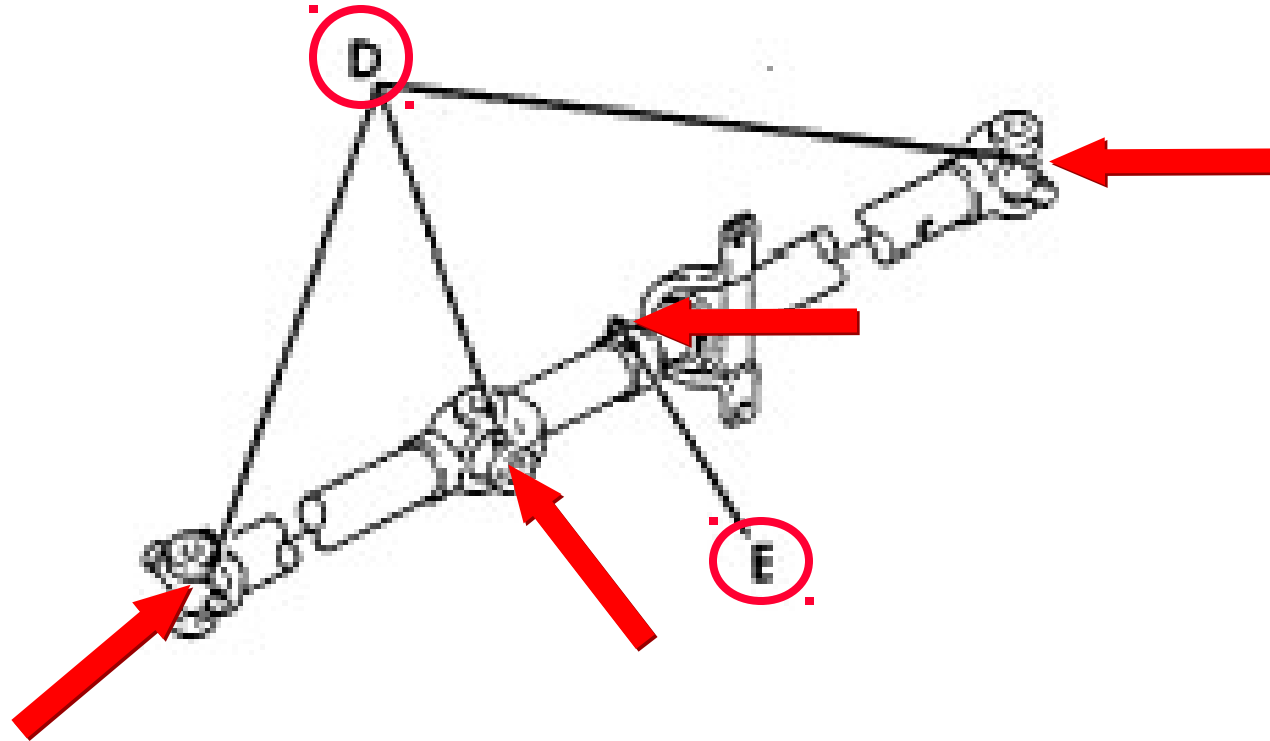
Lubrication Points

INTERVAL • LUBRICANT



Publications

Localized Lubrication Points



FRONT PROPELLER SHAFT
UNIVERSAL AND SLIP JOINTS

Publications

Lubrication Notes

- **Notes**

- **Oil can points**
- **Winch wire rope**
- **Pintle**
- **Steering system**
- **Power steering reservoir**
- **Transmission**
- **Crankcase oil level**

Publications

Organizational technical manuals provide technical information normally not needed by the Operator/Crew. However, the Maintenance Allocation Chart (MAC) is periodically needed and can be found in all -20 level Technical Manual's

Are you performing maintenance above your level of authorization ??

Open TM 9-2320-280-20

Publications

Maintenance Allocation Chart (MAC)

- **Primary tool for determining at which level a maintenance task should be performed**
- **Shows the lowest level authorized to perform a specific task**
- **Made on the basis of time, tools, and skills normally available at the location where work is to be done**
- **This section provides a general explanation of all maintenance and repair functions authorized at various maintenance levels under the standard Army Maintenance System Concept.**
- **The Maintenance Allocation Chart (MAC) designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component.**

Publications

Maintenance Allocation Chart (MAC)

- The application of the maintenance functions to the end item or component will be consistent with the capacities and capabilities of the designated maintenance levels, which are shown on the MAC in column (4) as:

Levels

Unit - two sub columns
(operator/crew)

Direct Support

General Support

Depot

Categories

C

O (unit)

F

H

D

Publications

Maintenance Allocation Chart (MAC)

TM 9-2320-280-20-3

Section II. MAINTENANCE ALLOCATION CHART (Cont'd)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
1802	Doors, Rear	Inspect Replace Repair	0.1	0.2	F			1 1,5,139	F
	Cover, Engine Access	Inspect Replace Repair	0.1	0.1	F			1 1,5,139	F
	Windshield Assembly, Folding	Inspect Replace Repair	0.1	2.0	F			1,2 1,5,139	F
	Windshield Assembly, Fixed	Inspect Replace Repair	0.1		2.0 F			1,6 1,5,139	F
	Windshield Glass	Inspect Replace	0.1	1.0					

Example

Publications

Maintenance Allocation Chart (MAC)

TM 9-2320-280-20-3

Section II. MAINTENANCE ALLOCATION CHART (Cont'd)

[1] Group Number	[2] Component/Assembly	[3]	[4] Maintenance Category	[5]	[6]
1802	Doors, Rear	I			
	Cover, Engine Access	I			
	Windshield Assembly, Folding	I			
	Windshield Assembly, Fixed	I			
	Windshield Glass				

Column 1 provides a reference grouping system for organization maintenance personnel.

- 18 is the group (windshield assembly)

- 02 is the subsystem, component, assembly or subassemblies of the group (glass)

Publications

Maintenance Allocation Chart (MAC)

TM 9-2320-280-20-3

Section II. MAINTENANCE ALLOCATION CHART (Cont'd)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category		(5) Tools and	(6) Units
1802	Doors, Rear	Inspect Replace Repair	0.1	1.0	2.0 F	1,6 1,5,139 F
	Cover, Engine Access	Inspect Replace Repair				
	Windshield Assembly, Folding	Inspect Replace Repair				
	Windshield Assembly, Fixed	Inspect Replace Repair				
	Windshield Glass	Inspect Replace				

Column 2 identifies the component/assembly in question, i.e. The assembly is the windshield and the component is the glass

Assembly

Component

Publications

Maintenance Allocation Chart (MAC)

TM 9-2320-280-20-3

Section II. MAINTENANCE ALLOCATION CHART (Cont'd)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
1802	Doors, Rear	Inspect Replace Repair	0.1	0.2	F			1 1,5,139	F
	Cover, Engine Access	Inspect Replace Repair	0.1	0.1	F			1 1,5,139	F
	Windshield Assembly, Folding	Inspect Replace Repair	0.1	2.2	F			1,2 1,5,139	F
	Windshield Assembly, Fixed	Inspect Replace Repair	0.1						
	Windshield Glass	Inspect Replace	0.1						

Column 3 shows the action performed. See the MAC chart introduction (Para B-2) for detailed explanations

Publications

Maintenance Allocation Chart (MAC)

TM 9-2320-280-20-3

Section II. MAINTENANCE ALLOCATION CHART (Cont'd)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct General	General Support	Depot		
			C	O	F	H	D		
	Doors, Rear	Inspect Replace Repair	0.1	0.2	F			,5,139	F
	Cover, Engine Access	Inspect Replace Repair	0.1	0.1	F			,5,139	F
			0.1	2.0	F			,2 ,5,139	F
			0.1		2.0 F			,6 ,5,139	F
			0.1	1.0					

Column 4 shows the maintenance category/level and the man-hour times. See the MAC chart introduction

Column 4 shows the maintenance category/level and the man-hour times. See the MAC chart introduction (Para B-3d) for detailed explanations

Publications

Maintenance Allocation Chart (MAC)

TM 9-2320-280-20-3

Section II. MAINTENANCE ALLOCATION CHART (Continued)

(1)	(2)	(3)	(4) Maintenance Category					(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
			0.1	0.2				1 1,5,139	F
			0.1	0.1	F			1 1,5,139	F
			0.1	2.0	F			1,2 1,5,139	F
			0.1		2.0 F			1,6 1,5,139	F
	Windshield Glass	Inspect Replace	0.1	1.0					

Column 5 shows the tools and equipment codes and indicates the tools needed for a particular job. See the MAC chart introduction (Para B-3e) for detailed explanations and section III for the tool and test equipment requirement listing

Publications

Maintenance Allocation Chart (MAC)

TM 9-2320-280-20-3

Section II. MAINTENANCE ALLOCATION CHART (Cont'd)

(1) Group Number	(2)	(3) Maintenance	(4) Maintenance Category				(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit	Direct Support	General Support	Depot		
			O	F	H	D		
1802			0.2	F			1 1,5,138	F
			0.1	F			1 1,5,138	F
			2.0	F			1,2 1,5,138	F
			2.0	F			1,6 1,5,138	F
	Windshield Glass	Repair Inspect Replace	0.1					
			1.0					

Column 6 identifies any remarks codes associated to the group. See the MAC chart introduction (Para B-5) for detailed explanations and section IV for the remarks code listing



Publications

Technical Bulletins (TB's)

Publications

TB Summary

Technical Bulletins generally provide information on a specific subject for equipment or item, it may authorize certain maintenance actions, and give advance information on future publication changes.

- **PS Magazine (TB 43-PS-xxx)**
- **TB 43-0142, Safety Inspection and Testing of Lifting Devices**

Publications

Standing Operating Procedures (SOP)

Publications

SOP

What is a SOP?

- **An SOP formally describes the way a unit performs it's mission**
- **It is the commanders policy on unit procedures and policies**
- **It is the lowest form of a regulation**

Publications

SOP

Requirements: (IAW DA Pam 750-35 Chap 5-1)

- **All unit's performing maintenance are required to have a SOP i.e Motor Pools, Arms rooms, NBC rooms etc..**
- **The unit maintenance portion of the SOP should be written in enough detail to
give personnel a firm grasp of how maintenance is performed in the unit**

Publications

SOP

- **The portion you should most be concerned about in this class is procedures for scheduled operator PMCS**

Publications Resouces

Publication Sites

<http://www.usapa.army.mil/>



The screenshot shows a web browser window displaying the U.S. Army Publishing Agency Home Page. The page has a grey sidebar on the left with various links and a main content area on the right. The browser's address bar shows the URL <http://www.usapa.army.mil/>. The page title is "Welcome to the U.S. Army Publishing Agency Home Page". The main content area features a welcome message, a date/time stamp, and several sections of announcements and links.

Welcome to the U.S. Army Publishing Agency Home Page

USAPA is the *Army's* leader in publishing and distributing information products, employing advanced technologies to ensure responsive support worldwide. Our primary mission is supplying information to enhance the readiness of the **total force**.

● The current date/time is - Thu Dec 28 07:18:05 EST 2000 ●

ATTENTION:

1. [Important announcement](#) about AR 670-1 (Wear and Appearance of Army Uniforms and Insignia)
2. [Important announcement](#) about the Army-wide Enterprise Forms Software Site License

[News and Official Information!](#) NEW! as of - 12/14/00
-Please Read This-

[Army Administrative Electronic Publications](#) (ARs, DA Pamphlets, Circulars, etc.)
This library consists of the HTML, PDF, BOO, and XML files.

[Army Electronic Forms](#)
These forms are in FormFlow, FormFlow 99, PDF, JetForm and Novell InForm formats.

[Publications Ordering and Subscription System](#)
Resupply & ID Ordering System for Army Publications and Forms

[Publications Ordering for the General Public](#) {External Site}
National Technical Information Service

PCO/FMO Training Workshop 2000 Training Table Slides and Handout NEW!
Centralized Publishing Branch, Publishing Division [handouts](#)
Electronic Technology Branch, Publishing Division [slides](#)

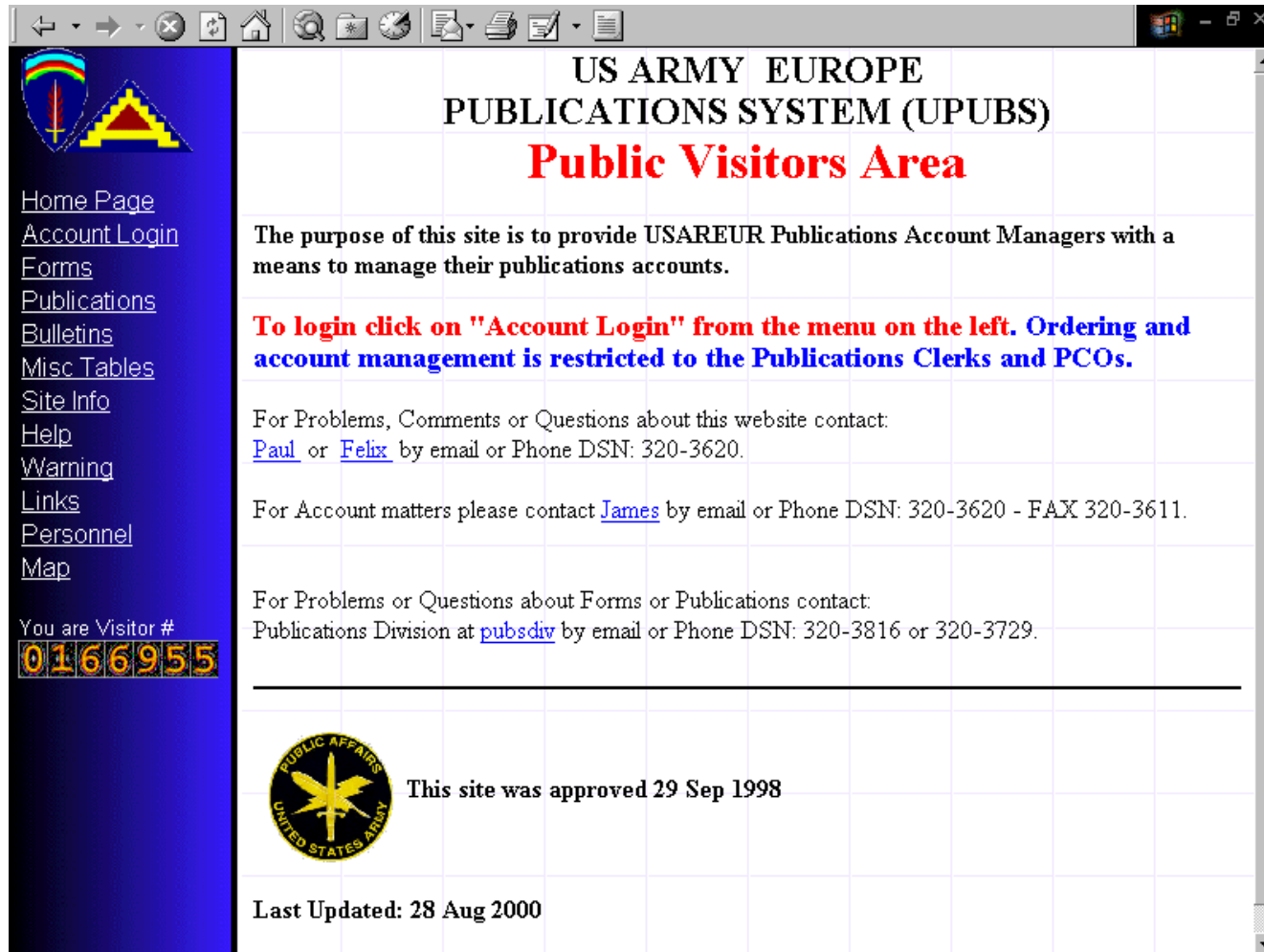
Left Sidebar:

-  **WARNING!**
[READ THE DISCLAIMERS!](#)
FOR UNCLASSIFIED,
NON-SENSITIVE,
NON-PRIVACY ACT
USE ONLY
-  **DA PAM**
[25-30 Extract for Resupply Items](#)
-  **FAQS**
[Frequently Asked Questions](#)
-  **Customer Service**
[\(Publication Orders\)](#)
-  **USAPA Publications**

Publications Resources

Publication Sites

<http://upubs.army.mil/>



The screenshot shows a web browser window displaying the US Army Europe Publications System (UPUBS) Public Visitors Area. The browser's address bar shows the URL <http://upubs.army.mil/>. The website has a blue sidebar on the left with a navigation menu and a visitor counter. The main content area is white with a grid background and contains the site's title, a welcome message, login instructions, contact information, and a footer with a logo and approval date.

**US ARMY EUROPE
PUBLICATIONS SYSTEM (UPUBS)
Public Visitors Area**

The purpose of this site is to provide USAREUR Publications Account Managers with a means to manage their publications accounts.

To login click on "Account Login" from the menu on the left. Ordering and account management is restricted to the Publications Clerks and PCOs.

For Problems, Comments or Questions about this website contact:
[Paul](#) or [Felix](#) by email or Phone DSN: 320-3620.

For Account matters please contact [James](#) by email or Phone DSN: 320-3620 - FAX 320-3611.

For Problems or Questions about Forms or Publications contact:
Publications Division at [pubsdiv](#) by email or Phone DSN: 320-3816 or 320-3729.

 This site was approved 29 Sep 1998

Last Updated: 28 Aug 2000

Navigation Menu (Left Sidebar):

- [Home Page](#)
- [Account Login](#)
- [Forms](#)
- [Publications](#)
- [Bulletins](#)
- [Misc Tables](#)
- [Site Info](#)
- [Help](#)
- [Warning](#)
- [Links](#)
- [Personnel](#)
- [Map](#)

Visitor Counter: You are Visitor # **0166955**

Publications Resources

Publication Sites

<http://www.logsa.army.mil/pubs.htm>

The screenshot shows a web browser window displaying the LOGSA (Logistics Support Agency) website. The browser's address bar shows the URL <http://www.logsa.army.mil/pubs.htm>. The website has a dark header with the LOGSA logo on the left and navigation links on the right: "System Access Request (SAR)" with a green arrow, "Site Map" with a green arrow, "Comments Questions" with a blue arrow, and "Search the LOGSA Site" with a red arrow. A left sidebar contains a vertical menu with links: "Introduction", "Commander's Message", "The Organization", "Directories", "Products & Services", "What's New", "WebLOG", "Publications & Forms" (highlighted), and "Links". The main content area is titled "Publications & Forms" in a large, stylized font. Below this title, there are three main sections: 1. "PS Magazine Online": Features a cartoon character in a military uniform with a speech bubble saying "PS MAGAZINE IS NOW ONLINE CHECK IT OUT". Text reads "Now you can read... PS Magazine Online The Preventive Maintenance Monthly" and includes a link "Go to the Online Edition of PS Magazine". 2. "Electronic Technical Manuals ETMs ONLINE": Includes a small image of a computer monitor displaying technical data. Text reads "Electronic Technical Manuals ETMs ONLINE Your source for the most up-to-date technical publications available on your equipment." and includes a link "Go to Electronic Technical Manuals Online". 3. "ETM Bulletin": Features an image of a CD-ROM and a laptop. Text reads "Electronic Technical Manuals - ETMs on CD-ROM ETM Bulletin Your Source for the Latest ETM Information...!" and includes a link "View the Electronic Technical Manuals Bulletin". At the bottom of the page, there is a link for "Department of the Army Supply Catalogs".

Publications Resources

Publication Sites

<http://155.217.58.58/atdls.htm>

The screenshot shows a web browser window displaying the "General Dennis J. Reimer Training & Doctrine Digital Library". The page features a header with the title and a circular portrait of General Reimer. Below the header, there is a large section with the text "General Dennis J. Reimer Training and Doctrine Digital Library" and a background image of a globe with an American flag. To the left of this section, a black box contains text about the library's dedication to General Reimer and his tenure as Chief of Staff of the Army from June 20, 1995, to June 21, 1999. Below this text, there are links for "General Dennis J. Reimer's Biography", "Enter the Library", and "Privacy and Security Notice". The bottom of the page has a navigation bar with buttons for "The Library", "What's Hot!", "Register", "Search", "Schools", "Documents", "System/Strategies", "Other Sites", and "Help".

General Dennis J. Reimer Training & Doctrine Digital Library

General Dennis J. Reimer Training and Doctrine Digital Library

ARMYvalues

This Library has been dedicated to General Dennis J. Reimer.

General Reimer was the Chief of Staff of the Army from:
June 20, 1995
to:
June 21, 1999

"Soldiers are our credentials."

[General Dennis J. Reimer's Biography](#) [Enter the Library](#)
[Privacy and Security Notice](#)

The Library What's Hot! Register Search Schools
Documents System/Strategies Other Sites Help

Publications Resources

Publication Sites

<https://www.200mmc.21tsc.army.mil>

200TH MMC WEBSITE - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites History Mail Print Edit Discuss

Address <https://www.200mmc.21tsc.army.mil> Go Links

PHONE ROSTER **LOG LINKS** **FEEDBACK**

Choose a category from the list below, or search for a specific Publication by entering keyword(s) from the title (e.g. **TM 11-5895-1104** to find all TMs for the AN/MS-64(V)2 Satellite Terminal, or just **Satellite** to find all publications for *all* Satellite Terminals.

Find

Subject

- [Abrams Main Battle Tank M1 Series](#)
- [Air Compressors and Support Equipment](#)
- [Air Defense Systems and Related Equipment](#)
- [Air Drop and Delivery Equipment](#)
- [All Source Analysis System \(ASAS\)](#)
- [Ammunition Surveillance Test & Procedures](#)
- [Antennas, Masts & Related Equipment](#)
- [Anti and Counter Intrusion Devices](#)
- [Armored Combat Earthmove \(ACE\) M9](#)

Technical Manuals PDF Adobe Reader required

Start | Internet | 7:51 AM

Publications Resources

Publication Sites

<http://dodimagery.afis.osd.mil>

Defense Visual Information Directorate Home Page - Microsoft Internet Explorer

File Edit View Favorites Tools Help

 **AFIS Products | AFIS Services | About AFIS**



DoD Imagery @ JCCC
ComCam photos of Operations, Exercises, and other events worldwide

DoD Imagery @ DVIC
Record still and motion imagery

DoD VI Productions/IMI Products (DAVIS/DITIS)
Training and information videos, interactive training products, and more

DoD Image Collections
A wide variety of DoD Images cataloged by subject on CD-ROM

DoD Posters
Selected posters produced under the DoD Billboard Program

Visual Information and Combat Camera List Serves
Information and links to sign up for our list serves

Announcing


Enduring Freedom Images
Pentagon Attack Images
Pentagon Recovery Images
World Trade Center Recovery Images



U.S. Marines at Camp X-Ray in Guantanamo Bay, Cuba, are ready to handle incoming Afghan detainees (U.S. Navy photo by Photographer's Mate 1st Class (AW) Shane T. McCoy) (Released)

Last Updated:
01/11/2002

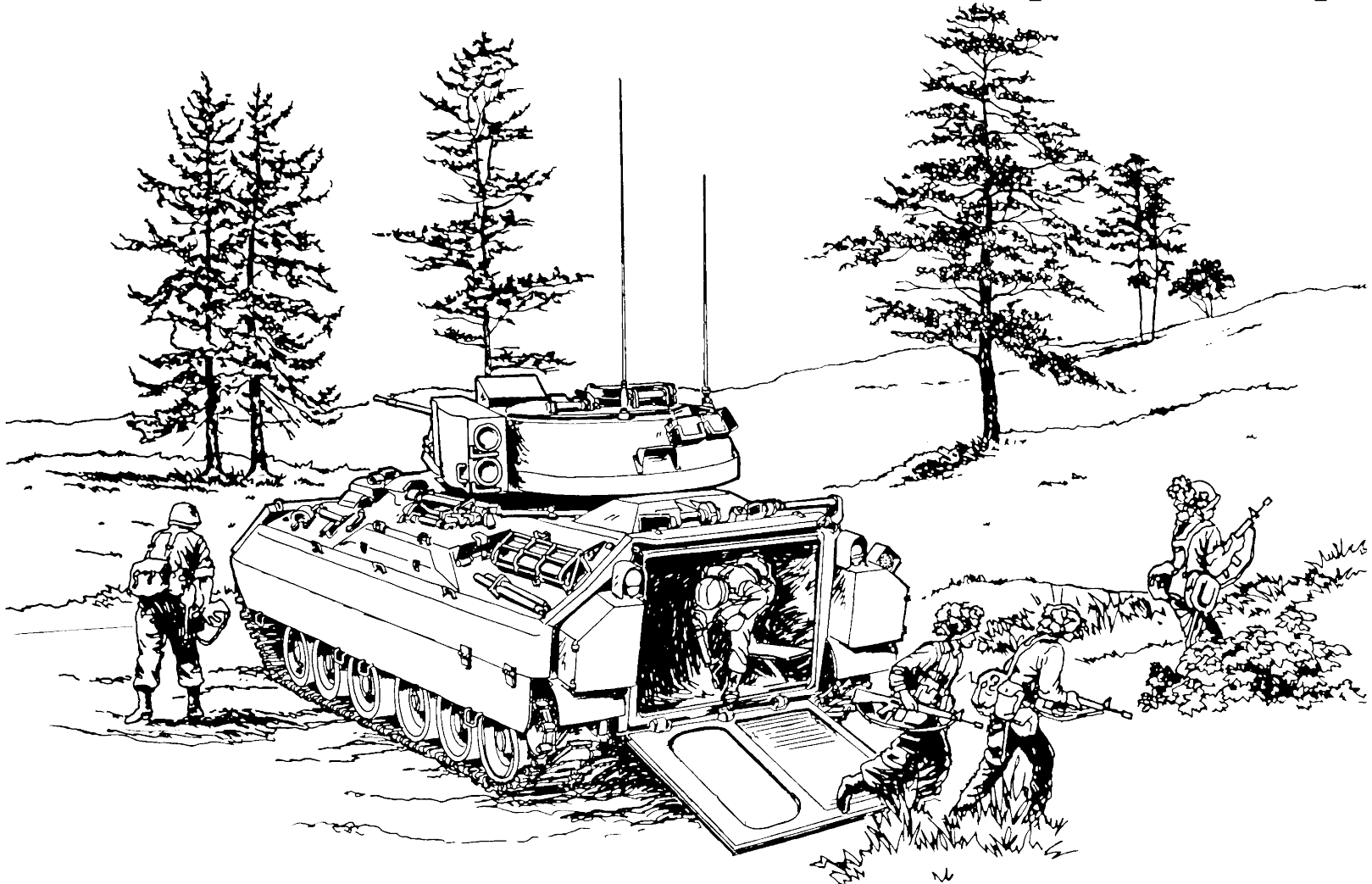
- Site Index
- Customer Service
- Find Defense Imagery
- Order/Initiate VI Production
- VI Policies/Procedures
- VI Term Definitions
- Tasking COMCAM
- Locate a VI Facility
- DoD VI Contacts
- About DVI

Visual Information Production Awards
The best training productions of 2000 - 2001 as judged by an independent panel

MILPHOG Winners
The best Military photography of

Start |                |     8:10 AM

Preventive Maintenance Checks and Services (PMCS)



Will you make it to the battle???

PMCS

Structure

Crew = The person/persons assigned as the TC or one who is accompanying the operator during equipment operation (They may or may not be licensed)

Operator = The person assigned to the equipment and is Licensed to operate the equipment

Organizational = Unit level mechanics assigned to perform scheduled and unscheduled maintenance and services

PMCS Structure

**Crew/operator performing PMCS is the
cornerstone of maintenance.**

**PMCS is the foundation of unit level
maintenance.**

**Unit Level Maintenance is the
foundation of the Army's maintenance
system.**

PMCS

PMCS Standard

The Army has one maintenance standard. The maintenance standard is based on TM 10 and 20-series, PMCS. This standard applies to all equipment except training aids

PMCS is performed in order to identify and correct faults, and perform required services on all assigned equipment.

AR 750-1, Para 3-1

PMCS

Commanders are required to maintain equipment at TM - 10/20 PMCS standards according to the appropriate technical manuals.

DA Pam 750-35, Para 2-5

PMCS

What the operator or supervisor knows

No assumptions should be made about what an operator or supervisor/leader knows.

- Know the unit's testing and training programs for PMCS and ULM Certification (USAREUR and 21st TSC ULM Program).**
- Know the unit's flow chart for PMCS (daily and weekly).**

PMCS

What the operator or supervisor knows

- **The company or unit commander must know what all equipment operators and their leaders know.**
- **All personnel must know what they are checking and what to do when they find a problem.**
- **The leader must know what the operator knows.**

PMCS

What the operator or supervisor knows

- **Should additional training be required,
the leader should give it or advise the commander that training assistance is required.**
- **Continual (sustainment) testing and training must be provided in order to provide confidence and improve competence of personnel.**

PMCS

Organizational Maintenance

In what TM level is the preventive maintenance checks and services checklist found for each vehicle?

PMCS

Intervals

- **BEFORE** checks and services must be performed prior to placing vehicle or its components in operation.
- **DURING** checks and services must be performed while the vehicle and/or its components/systems are in operation.
- **AFTER** checks and services are performed upon completion of mission.

PMCS

Intervals

- **WEEKLY checks and services are performed once every 7 days.**
- **MONTHLY checks and services are performed once every 30 days.**

PMCS

Fluid Leaks

Class I - Leakage indicated by wetness or discoloration not great enough to form drops.

Class II - Leakage great enough to form drops, but not enough to cause drops to drip from item being checked/inspected.

Class III - Leakage great enough to form drops (meaning plural) that fall from the item being checked/inspected.

PMCS

Safety requirements

AR and USAREUR Reg 385-55 (Prevention of Motor Vehicle Accidents)

- **These two regulations must be used when PMCSing equipment.**
- **They show in detail what safety NMC faults consist of.**

PMCS Results

- **The results of the PMCS inspection are recorded on DA Form 5988-E, Equipment Inspection and Maintenance Worksheet.**
- **DA Form 5988-E is an automated form produced by the Unit Level Logistics System-Ground (ULLS-G)**

PMCS

DA Form 5988-E

DATE: 20010510		EQUIPMENT MAINTENANCE INSPECTION WORKSHEET		DA FORM 5988-E	
W90CGP		5TH MAINTENANCE CO.			
----- EQUIPMENT DATA -----					
ADMIN NUM: 5-1		EQUIPMENT REGISTRATION TYPE			
EQUIP MODEL: M1025		COUNTRY			
EQUIP NOUN: TRK UTL ARMT CARR					
EQUIPMENT NSN: 2320011289551					
NUMBER					
PUBLICATION: TM 9-2320-280-10					
PUBLICATION: TM 9-2320-280-20					
INSPECTORS LIC #:		TIME:		SIGNATURE	
----- PARTS REQUESTED -----					
FAULT	DOC NUM	NIIN	NOUN	QTY	PRI
				DATE/REC	
----- MAINTENANCE FAULTS -----					
ITEM NUMBER	FAULT DATE	FAULT STATUS	FAULT DISCRIPTION	CORRECTIVE ACTION	HRS LIC
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

The data on
DA Form
5988-E is
divided into
four groups:

PMCS

DA Form 5988-E

DATE: 20010510

EQUIPMENT MAINTENANCE INSPECTION WORKSHEET

DA FORM 5988-E

W90CGP

5TH MAINTENANCE CO.

EQUIPMENT DATA

ADMIN NUM: 5-1

EQUIPMENT SERIAL NUM: 022267

EQUIP MODEL: M1025

REGISTRATION NUM: NEX039

EQUIP NOUN: TRK UTL ARMT CARR

TYPE INSPECTION: W

EQUIPMENT NSN:

000100

NUMBER

PUBLICATION:

PUBLICATION:

CHANGE NUMBER

00

01

INSPECTORS LIC #:

TIME:

Unit Heading - Shows
the date, title, form
number, UIC and unit

FAULT

DOC NUM

NIIN

NOUN

QTY
DUE/REC

STATUS
DATE

DATE
COMP

PRI

MAINTENANCE FAULTS

ITEM
NUMBER

FAULT
DATE

FAULT
STATUS

FAULT
DISCRIPTION

CORRECTIVE
ACTION

HRS

LIC

_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

PMCS

DA Form 5988-E

DATE: 20010510	EQUIPMENT MAINTENANCE INSPECTION WORKSHEET	DA FORM 5988-E
W90CGP	5TH MAINTENANCE CO.	
----- EQUIPMENT DATA -----		
ADMIN NUM: 5-1	EQUIPMENT SERIAL NUM: 022267	
EQUIP MODEL: M1025	REGISTRATION NUM: NLX039	
EQUIP NOUN: TRK UTL ARMT CARR	TYPE INSPECTION: W	
EQUIPMENT NSN: 2320011289551	CURRENT READING: 000100	
NUMBER	DATE	CHANGE NUMBER
PUBLICATION: TM 9-2320-280-10	01/61	00
PUBLICATION: TM 9-2320-280-20	06/68	01
INSPECTORS LIC #:	TIME:	SIGNATURE: TIME:

FAULT	<u>Equipment Data</u> - identifies the vehicle admin number, model number, noun, NSN, serial number, registration number, type of inspection, current reading (H=hours, M=miles, K=kilometers), publications and changes, operators license number & time and supervisors signature & time.	PRI
ITEM NUMBER		LIC

PMCS

DA Form 5988-E

DATE: 20010510		EQUIPMENT MAINTENANCE INSPECTION WORKSHEET		DA FORM 5988-E		
W90CGP		5TH MAINTENANCE CO.				
ADMIN NUM: EQUIP MODEL: EQUIP NOUN: EQUIPMENT NSN:		<u>Maintenance Faults -</u> Identifies the item number, fault date, fault status, fault description, corrective action, and operators hours and license number		022267 NLX039 W 000100		
NUM PUBLICATION: PUBLICATION:				CHANGE NUMBER 00 01		
INSPECTORS LIC #:				TIME:		
FAULT DOC NUM				DATE COMP PRI		
ITEM NUMBER	FAULT DATE	FAULT STATUS	FAULT DISCRIPTION	CORRECTIVE ACTION	HRS	LIC
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

PMCS

DA Form 5988-E

DATE: 20010510		EQUIPMENT MAINTENANCE INSPECTION WORKSHEET		DA FORM 5988-E			
W90CGP		5TH MAINTENANCE CO.					
----- EQUIPMENT DATA -----							
ADMIN NUM: 5-1		EQUIPMENT SERIAL NUM: 022267					
EQUIP MODEL: M1025		REGISTRATION NUM: NLX039					
EQUIP NOUN: TRK UTL ARMT CARR		TYPE INSPECTION: W					
EQUIPMENT NSN: 2320011289551		CURRENT READING: 000100					
NUMBER		DATE		CHANGE NUMBER			
PUBLICATION: TM 9-2320-280-10		01/61		00			
PUBLICATION: TM 9-2320-280-20		06/68		01			
INSPECTORS LIC #: _____ TIME: _____ SIGNATURE: _____ TIME: _____							
PARTS REQUESTED							
FAULT	DOC NUM	NIIN	NOUN	QTY DUE/REC	STATUS DATE	DATE COMP	PRI
ITEM NUMBER	The person performing the PMCS will place his or her License number here once a fault is annotated on the 5988-E		NTENANCE FAULTS		The supervisor will place his or her signature here when he or she has verified all faults on the DA Form 5988-E		
_____			AULT RIPTION				

PMCS

Status symbols

What is the definition of “shortcoming” ?

A fault that requires maintenance or supply action on a piece of equipment but does not render equipment NMC.

PMCS

Status symbols

What is the definition of “deficiency” ?

A fault or problem that causes equipment to malfunction. Faults that make equipment NMC are deficiencies.

PMCS

Status symbols

X

Deficiency

When an X status is annotated and directed IAW the TM, Not fully Mission Capable column, the item number will be circled.

If the X status symbol is directed IAW AR or USAREUR Reg 385-55 then the item number is not circled.

PMCS

Status symbols

Example of a TM NMC fault. Note the item number **is** circled



21	11 Apr 01	X	Transmission slips out of gear			
39	11 Apr 01	X	Horn is inoperative			

Example of a AR or USAREUR Reg 385-55 safety fault. Note the item number is **not** circled. The equipment **will not be operated unless** authorized by the unit commander in writing.

PMCS

Status symbols

Circled 

Deficiency, but may be operated under set limitations.

- **Only the commander or his / her designated representative may authorize limited operations.**
- **Limited operation is usually for a one-time use, but it is dependant on the mission.**

PMCS

Status symbols

Example of a circled X'ed fault. Note **Only** the commander **or** his or her **designated representative** may authorize limited operations

INSPECTORS LIC #:		<i>H1234</i>		TIME:		SIGNATURE:	<i>CPT Lawrence T. Conner</i>		TIME:	
-------------------	--	--------------	--	-------	--	------------	-------------------------------	--	-------	--

ITEM NUMBER	FAULT DATE	FAULT STATUS	FAULT DISCRIPTION	CORRECTIVE ACTION	HRS	LIC
<u>16</u>	<i>6 May 01</i>	<u>X</u>	<i>Weapon station is stuck and</i>	<i>During operation of the vehicle</i>		
			<i>will not turn</i>	<i>The weapon station will not</i>		
				<i>be used. 6 May 01</i>		<i>LTC</i>
				<i>6 May 2001 / 310 miles</i>		
<u>16</u>	<i>6 May 01</i>	<i>X</i>	<i>Weapon station is stuck and</i>			
			<i>will not turn</i>			

Example of a circled X'ed fault that was returned to a X fault once the mission was completed. 193

PMCS

Status symbols

/

Shortcoming

Shows a fault with equipment other than a deficiency (shortcoming). Faults must be fixed to make the equipment fully usable and to prevent more problems.

PMCS

Status symbols



Example of a shortcoming fault (forward slash: /)

21	11 Apr 01	X	Transmission slips out of gear	
39	11 Apr 01	X	Horn is inoperative (Safety)	
64	11 Apr 01	/	R/front tow hook broken off	

PMCS

Status symbols

-

Modification Work Order (MWO)/Inspection/Replacement

- Shows that an inspection, component replacement, or overdue MWO has not been completed or applied.
- For USAREUR Units it will annotate “Last Brake Test” and date.

Modification Management Information System (MMIS)
web site: [**http://65.196.121.253/mwo/**](http://65.196.121.253/mwo/)

AEPS web site: [http://aeps.ria.army.mil/aepspublic.cfm**](http://aeps.ria.army.mil/aepspublic.cfm)**

PMCS

Typical DA Form 5988-E

Example of a MWO that has not been applied. Note this MWO is over due for application



9	27 Feb 01	-	Apply the 3 point seat belt	DSU W/O# W125972		
			13 Mar 01	W		H1234

PMCS

Status symbols

Last name initial

Shows a completely satisfactory condition or a corrected fault.

This is done by the commander or designated representative, designating a qualified person that has not performed the repair work, but is qualified in the maintenance procedure.

PMCS

Status symbols

Example of a Last Name Initial over the status symbol X. Note this will only be annotated on X status symbols



42	11 Apr 01	P	L/rear 1 ea lug nut broken off	Lug Stud replaced	C4321
----	-----------	---	--------------------------------	-------------------	-------

PMCS

Status symbols

E

Safety NMC

Shows that a piece of equipment is NMC for administrative or safety reasons.

Must be circle X for use.

This code is assigned by the ULLS-G operator.

PMCS

Status symbols

Example of a AR or USAREUR Reg 385-55 fault. Note the item number is not circled

Before



16	8 May 01	X	F/Pass seat belt missing (Safety)	1 ea, DOC# 1128-001		
				NSN 2278-01-233-1788		

After



----- PARTS REQUESTED -----							
FAULT	DOC NUM	NIIN	NOUN	QTY DUE/REC	STATUS DATE	DATE COMP	PRI
001	1128 0001	O12331788	Belt seat	001/000			05
----- MAINTENANCE FAULTS -----							
ITEM NUMBER	FAULT DATE	FAULT STATUS	FAULT DISCRIPTION	CORRECTIVE ACTION		HRS	LIC
001	8 May 01	E	F/Pass seat belt missing				
			10 May 01				H1234

Example of a "E" status code. Note this is generated buy the ULLS-G system once the ULLS Clerk has annotated it.

PMCS

Status symbols

Example of a daily, weekly and monthly PMCS with no faults found.

INSPECTORS LIC #:			TIME:		SIGNATURE:		TIME:	
----- PARTS REQUESTED -----								
FAULT	DOC NUM	NIIN	NOUN	QTY DUE/REC	STATUS DATE	DATE COMP	PRI	

----- MAINTENANCE FAULTS -----						
ITEM NUMBER	FAULT DATE	FAULT STATUS	FAULT DISCRIPTION	CORRECTIVE ACTION	HRS	LIC
9	27 Feb 01	-	Apply the 3 point seat belt	DSU W/O# W125972		
			13 Mar 01	W		H1234
			16 Mar 01			H1234
			20 Mar 01	W		H1234
			23 Mar 01			H1234
			27 Mar 01	W		H1234
			30 Mar 01			H1234
			4 Apr 01	M		H1234

PMCS

Practical Exercise 1

(PMCS Fault Annotation)

TASK: Complete a B, D, A and Weekly PMCS as an operator of a M1025 HMMUV. Annotate on DA Form 5988-E using the following provided scenarios

CONDITION: Given a blank DA Form 5988-E, TM 9-2320-280-10, the appropriate MAC, and all other related references.

STANDARD: Complete DA Form 5988-E

NOTE: No repairs can be made.

PMCS

Practical Exercise 1

2	Before	Left Side Tires	<u>DRIVER</u> <u>WARNING</u> Operating a vehicle with a tire in an underinflated condition or with a questionable defect may lead to premature tire failure and may cause equipment damage and injury or death to personnel. Visually check tires for presence and under inflation.	Tire missing, deflated, or unserviceable.
---	--------	--------------------	--	---

Left front tire is dry rotted
See troubleshooting table

PMCS

Practical Exercise 1

ITEM NUMBER	FAULT DATE	FAULT STATUS	FAULT DISCRIPTION	CORRECTIVE ACTION	HRS	LIC
2	Date	X	L/FT tire dry rotted (safety)			

PMCS

Practical Exercise 1

9	Before	Seat and Seatbelts	NOTE Vehicle operation with inoperative seatbelts may violate AR 385-55. a. Check all seatbelts for security, damage, and operation of buckle and clasp ends. b. Check operation of seat adjusting mechanism (driver's seat only).	b. Seat adjustment lock broken or missing.
---	--------	--------------------	---	--

Passenger seat belt broken
See troubleshooting table

PMCS

Practical Exercise 1

ITEM NUMBER	FAULT DATE	FAULT STATUS	FAULT DISCRIPTION	CORRECTIVE ACTION	HRS	LIC
9	Date	X	Pass seat belt broken			

(safety)

PMCS

Practical Exercise 1

9	Before	Seat and Seatbelts	NOTE Vehicle operation with inoperative seatbelts may violate AR 385-55. a. Check all seatbelts for security, damage, and operation of buckle and clasp ends. b. Check operation of seat adjusting mechanism (driver's seat only).	b. Seat adjustment lock broken or missing.
---	--------	--------------------	---	--

Driver seat belt missing
See troubleshooting table

PMCS

Practical Exercise 1

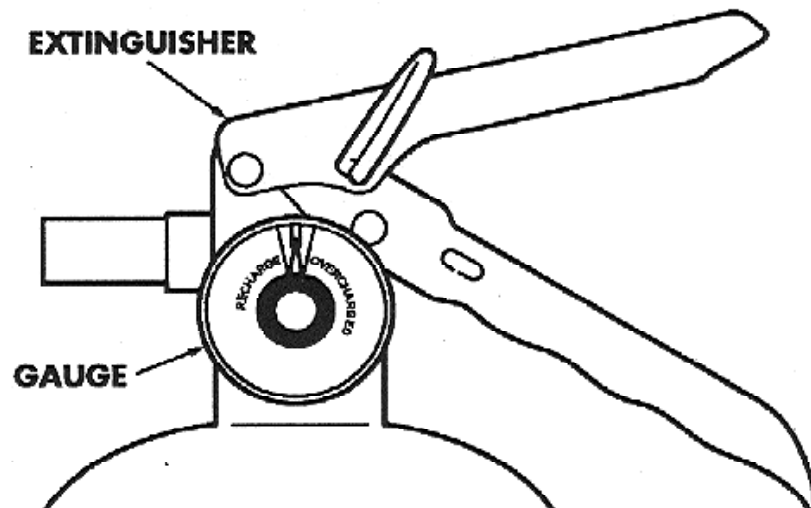
ITEM NUMBER	FAULT DATE	FAULT STATUS	FAULT DISCRIPTION	CORRECTIVE ACTION	HRS	LIC
9	Date	X	Drivers seat belt M			

(safety)

PMCS

Practical Exercise 1

10	Before	Fire Extinguisher	<u>DRIVER</u> a. Check for missing or damaged fire extinguisher. b. Check gauge for proper pressure of about 150 psi (1034 kPa). c. Check for damaged or missing seal.	a. Fire extinguisher missing or damaged. b. Pressure gauge needle in recharge area. c. Seal broken or missing.
----	--------	-------------------	--	---



Fire extinguisher seal missing
See troubleshooting table

PMCS

Practical Exercise 1

ITEM NUMBER	FAULT DATE	FAULT STATUS	FAULT DISCRIPTION	CORRECTIVE ACTION	HRS	LIC
10	Date	X	Fire Ext seal M			

PMCS

Practical Exercise 1

20	During	Power-train	<u>DRIVER</u> Be alert for unusual noises or vibrations from engine, transmission, transfer, differentials, propeller shafts, axle shafts, or wheels.	Unusual noise or vibration detected.
----	--------	-------------	--	--------------------------------------

Engine runs rough
See troubleshooting table

PMCS

Practical Exercise 1

ITEM NUMBER	FAULT DATE	FAULT STATUS	FAULT DISCRIPTION	CORRECTIVE ACTION	HRS	LIC
20	Date	X	Engine runs rough			

PMCS

Practical Exercise 1

39	After	Horn	<u>DRIVER</u> NOTE Vehicle operation with inoperative horn may violate AR 385-55. Check operation of horn if tactical situation permits.	
----	-------	------	--	--

Horn is inoperative
See troubleshooting table

PMCS

Practical Exercise 1

ITEM NUMBER	FAULT DATE	FAULT STATUS	FAULT DISCRIPTION	CORRECTIVE ACTION	HRS	LIC
39	Date	X	Horn is inop (safety)			

PMCS

Practical Exercise 1

40	After	Wind-shield and Wipers	NOTE Vehicle operation with damaged windshield may violate AR 385-55. a. Check windshield for damage that would impair operator's vision. NOTE Vehicle operation with inoperative wipers may violate AR 385-55. b. Check windshield wiper and blade for presence and damage. c. Check windshield wipers and washer for proper operation.	a. Windshield is cracked, broken, or discolored (cloudy) sufficiently to impair operator's vision.
----	-------	------------------------	--	--

Left & right side wind shield wiper blades missing

PMCS

Practical Exercise 1

ITEM NUMBER	FAULT DATE	FAULT STATUS	FAULT DISCRIPTION	CORRECTIVE ACTION	HRS	LIC
40	Date	X	L + R FT Wiper blades			
			M			

(safety)

PMCS

Practical Exercise 1

41.1	Weekly	Hand Throttle	<u>DRIVER</u> a. Check hand throttle and mounting bracket for security. Check throttle release button to ensure hand throttle cable operates properly. b. Check hand throttle cable for corrosion, nicks, breaks, or burns.	
------	--------	---------------	---	--

The hand throttle is stuck in the idle position

See troubleshooting table

PMCS

Practical Exercise 1

ITEM NUMBER	FAULT DATE	FAULT STATUS	FAULT DISCRIPTION	CORRECTIVE ACTION	HRS	LIC
41.1	Date	/	Hand throttle stuck			

in idle

PMCS

Practical Exercise 1

42	Weekly	Tires (Cont'd)	b. Measure tread thickness. Tread depth should not be less than 1/16-inch (1.59-mm) thick. (1.59-mm). c. Check for missing or loose wheel stud nuts and lug nuts. Tighten loose lug nuts and have unit maintenance tighten stud nuts and lug nuts to proper torque.	b. Tread depth less than 1/16-inch c. Any wheel stud nut or lug nut is broken or missing.
----	--------	-------------------	---	---

***The right front tire tread is 1.50 mm thick
See troubleshooting table***

PMCS

Practical Exercise 1

ITEM NUMBER	FAULT DATE	FAULT STATUS	FAULT DISCRIPTION	CORRECTIVE ACTION	HRS	LIC
42	Date	X	R/FT tire tread is			

1.50mm

PMCS

Practical Exercise 1

43	Weekly	Exhaust System	<u>DRIVER</u> Check exhaust system for security of all mounts, tightness of clamps and bolts, rusted conditions, damaged pipes, and any indication of an exhaust leak.	Any mounts are broken, pipes are rusted through or broken, and any indication of an exhaust leak.
----	--------	----------------	---	---

Exhaust pipe leaks at joint
See troubleshooting table

PMCS

Practical Exercise 1

ITEM NUMBER	FAULT DATE	FAULT STATUS	FAULT DISCRIPTION	CORRECTIVE ACTION	HRS	LIC
43	Date	X	Exhaust leak at joint (muffler and pipe)			

PMCS

Practical Exercise 1

44	Weekly	Shock Absorbers	<u>DRIVER</u> Visually inspect shock absorbers for leaks, damage, and security of mounting.	Class III leakage or damage is evident; mounting damaged or loose.
45	Weekly	Doors and Windows	<u>DRIVER</u> Check operation of doors and windows.	
46	Weekly	Tailgate	<u>DRIVER</u> Check operation of tailgate. Check that tailgate latches securely and operates properly.	

R/R shock bent, R/F window broken, Tail gate is bent and will not close
See troubleshooting table

PMCS

Practical Exercise 1

ITEM NUMBER	FAULT DATE	FAULT STATUS	FAULT DISCRIPTION	CORRECTIVE ACTION	HRS	LIC
<u>44</u>	<u>Date</u>	<u>X</u>	<u>R/R Shock bent</u>	<u></u>	<u></u>	<u></u>
<u>45</u>	<u>Date</u>	<u>X</u>	<u>R/F Window broken</u>	<u></u>	<u></u>	<u></u>
<u>4</u>	<u>Date</u>	<u>/</u>	<u>(safety)</u>	<u></u>	<u></u>	<u></u>
<u>6</u>	<u></u>	<u></u>	<u>tail gate bent</u>	<u></u>	<u></u>	<u></u>
<u></u>	<u></u>	<u></u>	<u>and</u>	<u></u>	<u></u>	<u></u>

will not close

PMCS

Practical Exercise 1

47	Weekly	Armament Carriers	(TOW and armament carriers M966, M966A1, M1036, M1045, M1045A1, M1045A2, M1046, M1046A1, M1025, M1025A1, M1025A2, M1026, M1026A1, M1043, M1043A1, M1043A2, M1044, M1044A1, and M1121 only) a. Inspect cargo shell door for bends, warping, binding, and ease of operation. Inspect latching mechanisms for proper operation. Inspect lift cylinders for bends and security of mounting.	a. Lift cylinders or latches bent, warped, binding, or inoperative.
----	--------	-------------------	--	---

Rear cargo lift cylinders do not hold
See troubleshooting table

PMCS

Practical Exercise 1

ITEM NUMBER	FAULT DATE	FAULT STATUS	FAULT DISCRIPTION	CORRECTIVE ACTION	HRS	LIC
47	Date	X	Cargo lift cyl's do not			

hold

PMCS

Practical Exercise 1

55	Weekly	Weapon Station	(M966, M966A1, M1036, M1045, M1045A1, M1045A2, M1046, M1046A1, M1025, M1025A1, M1025A2, M1026, M1026A1, M1043, M1043A1, M1043A2, M1044, M1044A1, and M1121 only) a. Inspect weapon station hatch and hinge for bends, cracks, warped, or damaged areas. b. Inspect brake handle for ease of operation. c. Inspect gunner's sling for tears or frays.	
----	--------	----------------	---	--

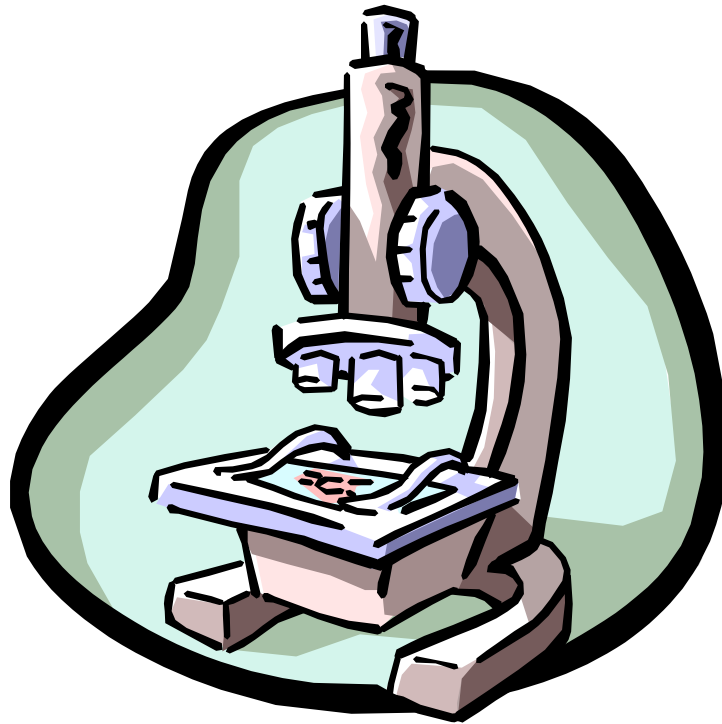
Gunner's sling broken
See troubleshooting table

PMCS

Practical Exercise 1

ITEM NUMBER	FAULT DATE	FAULT STATUS	FAULT DISCRIPTION	CORRECTIVE ACTION	HRS	LIC
55	Date	/	Gunners sling broken			

Army Oil Analysis Program (AOAP)



Army Oil Analysis Program (AOAP)

AOAP & ULM

Intent:

- **Raise Overall Awareness of Importance**
- **Review References and Requirements**
- **Review Problems and Sampling Techniques**

**Training / Testing must be
included in the Unit ULM
Program**

Army Oil Analysis Program (AOAP)

What is AOAP ?

**Part of a DOD effort to detect
impending equipment component
failures and to determine
lubricant condition through online
and periodic analytical evaluation
of lubricants**

Army Oil Analysis Program (AOAP)

**MANDATORY maintenance tool
for all aeronautical and
selected non-aeronautical
equipment in the Army
inventory**

Army Oil Analysis Program (AOAP)

What is sampled, when ?

**Hundreds of different end items
are included in the AOAP**

Army Oil Analysis Program (AOAP)

- **AR 750-1, para 4-36, Army Material Maintenance Policy and Retail Maintenance Operations**
- **USAREUR Supplement 1 to AR 750-1, App T, Army Material Maintenance Policy and Retail Maintenance Operations**
- **Mannheim Laboratory Center External SOP**

Army Oil Analysis Program (AOAP)

- For **Nonaeronautical** equipment:
 - **DA Pam 738-750, Chap 4,
Functional Users Manual for The
Army Maintenance
Management System (TAMMS)**
 - **TB 43-0211, AOAP Guide for
Leaders**

Army Oil Analysis Program (AOAP)

➤ For Aeronautical equipment:

- DA Pam 738-751, Functional Users Manual for the Army Maintenance System-Aviation (TAMMS-A)**
- TB 43-0106, Aeronautical Equipment, Army Oil Analysis Program (AOAP)**

Army Oil Analysis Program (AOAP)

In addition to identifying equipment and components to be sampled, these publications list the routine sampling intervals and under what conditions special sampling is needed, sampling techniques, supplies, and records management

Army Oil Analysis Program (AOAP)

What AOAP can do for you **(*WIIFM*)**

- **Saves hours of maintenance**
- **Gives commander information about equipment condition and maintenance quality**
- **Improves equipment reliability**
- **Design changes and product improvement**

Army Oil Analysis Program (AOAP)

**Short run - decrease
maintenance costs**

**Long run - improves readiness
and enhances safety by reducing
the number of not mission
capable (NMC) items**

Army Oil Analysis Program (AOAP)

USAREUR AOAP Laboratory Locations

- **Mannheim (Coleman Barracks),
bldg 50, DSN 382-5288 / 4254**
- **Bamberg (Warner Barracks),
bldg 7487, DSN 469-8427 /
8424**
- **Kosovo**
- **Bosnia**

Army Oil Analysis Program (AOAP)

Samples

Mannheim / Bamberg

Air 10,830

Ground 170,699

TOTAL 181,529 (FY02)

Total Oil Change Cost

Savings: \$

7,826,126.00

Army Oil Analysis Program (AOAP)

Samples

- **99.9% laboratory accuracy**
- **6% (10,891) require re-sampling**

Army Oil Analysis Program (AOAP)

**Lubrication orders (LOs) are
being rewritten to reflect the
requirement for on-condition or
laboratory-recommended oil
changes for non-aeronautical
equipment**

Army Oil Analysis Program (AOAP)

CAUTION

WARRANTY

**You must follow the
manufacture's
recommendation for oil and
filter changes for equipment
under warranty.**

Army Oil Analysis Program (AOAP)

CAUTION

**Seasonal and special oil changes
must still be made if called for
by the Lubrication Order (LO)**

Army Oil Analysis Program (AOAP)

Responsibilities

- **Commander** - emphasize and actively promote
- **Unit Maintenance Officer** - ensure personnel review and comply
- **AOAP Monitor** - unit liaison

Army Oil Analysis Program (AOAP)

Responsibilities

- **Maintenance Supervisor** - ensure knowledgeable people sample IAW prescribed intervals
- **Operator / Crew** - sample equipment at prescribed intervals, **“Heart of the Program..”** ! Program success rests squarely on your shoulders.

Army Oil Analysis Program (AOAP)

Types of samples

Routine
Special

Army Oil Analysis Program (AOAP)

Routine

IAW DA Pam 738-750, Chapter 4

Special

- **At laboratory request**
- **Immediately before equipment transfer**
- **Indication of problems/contamination**
- **After maintenance overhaul**
- **When deemed necessary by Cmdr**

Army Oil Analysis Program (AOAP)

AOAP Forms

DA Form 5991-E, Oil Analysis Request

- **Units request to the laboratory**
- **Results are recorded on this form:**

NORMAL or ABNORMAL

Note:

**If ABNORMAL, the unit will be notified by
telephone in addition to the DA Form 5991-
E.**

Army Oil Analysis Program (AOAP)

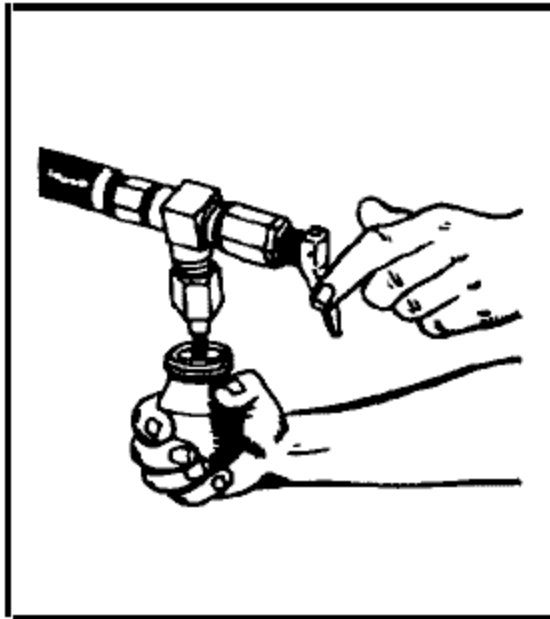
Sampling Methods

Valve Method

Pump Method

Army Oil Analysis Program (AOAP)

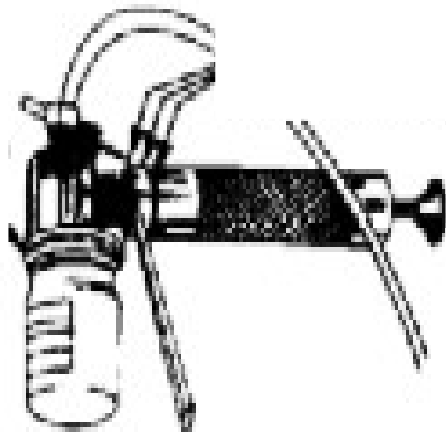
Valve Method



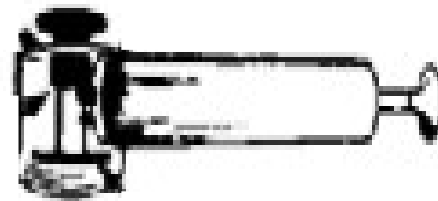
Army Oil Analysis Program (AOAP)

Pump Method

Pump
(with stand)



Pump
(no stand)



Army Oil Analysis Program (AOAP)

**Permanent
Relocation /
Temporary
Deployment**

- **Notify AOAP Laboratory**
- **Laboratory transfers records**

REMINDER

**A special sample is taken before
equipment is transferred or
deployed**

Army Oil Analysis Program (AOAP)

Variance

**10% before or after the due
date/hours**

Army Oil Analysis Program (AOAP)

Conversion Method:

10 miles / 16 kilometers = 1 hour

Army Oil Analysis Program (AOAP)

**MANDATORY maintenance tool for
all aeronautical and selected
non-aeronautical equipment in
the Army inventory**

**Like other maintenance tools,
it must be used properly to be
effective.**

Army Oil Analysis Program (AOAP)

Number 1 Causes for Re-sampling

- **Wrong Attitude**
- **Improper procedures**
 - **failed to clean the valve**
 - **failed to clean the pump**
 - **tube too long / short**
 - **all samples from same source**

Army Oil Analysis Program (AOAP)

Other Causes for Re-sampling

- **Improper training**
- **Weather**
 - **rain / snow**
- **Improper marking / documents**
- **Poor packaging / handling**

Army Oil Analysis Program (AOAP)

Command AOAP Coordinator

**SFC Atkinson
HQ, 21st TSC, G4
484 7804**

Instructing Techniques



Instructing Techniques

Intent:

- ✓ **Provide Cadre with data resources**
- ✓ **Improve Cadre instructing abilities**
- ✓ **Review techniques not trained at NCOES**

Why ?? What role does Instructing have during ULM Training / Certification ??

- ✓ **Instructors set the training atmosphere effecting student learning attitudes**
- ✓ **Poorly prepared and/or presented training is ineffective (waste of**

Instructing Techniques

Principles of Instructing

- **Be prepared**
- **Know the subject matter**
- **Speak clearly**
- **Use available technology**
- **Present and conduct yourself in a professional manner**

Instructing Techniques

References

- **DA Pam 25-37, Index of Graphic Training Aids**
- **Training Circulars**
- **<http://www.atsc.army.mil> (Army Training and Support Center)**
- **Local Training Aid Support Center (TASC)**

Instructing Techniques

Resources

- **Command**
- **MAIT (NCOPD, OPD, etc.)**
- **Logistics Assistance Representative (LAR)**
- **Invite a subject matter expert to your course**
- **Local Education Center/MOS library**
 - **Class room**
 - **Publications**
 - **Equipment to support the class**

Instructing Techniques

Resources

- **Local visual (information) center**
 - **Technical tapes**
 - **Overhead projectors**
 - **Projection screens**
 - **Extension cord(s)**
- **Publication clerk**
 - **Can order publications and blank forms**
- **The Internet**
 - **World of information**

Instructing Techniques

Steps in Preparation

- **Determine the *need* and the *objectives* for training.**
- **Determine the *approach*.**
- **Decide who will *do* / *assist* / *attend* the training.**

Instructing Techniques

Steps in Preparation

- **Establish a plan for the subjects.**
- **Coordinate for locations of instruction.**
- **Gather training aids and instructional material.**

Instructing Techniques

Personal Techniques

- **Stay focused on student personnel**
- **Avoid pacing**
- **Speak clearly and use common words when possible**
- **Dress appropriate for the occasion**
- **Control hand and foot motions**

Instructing Techniques

The 11 Deadly Sins of an Instructor

- **Appearing unprepared**
- **Improper handling of questions**
- **Apologizing for yourself or the Organization**
- **Unfamiliar with subject matter**
- **Unprofessional use of audio/video aids**

Instructing Techniques

The 11 Deadly Sins of an Instructor

- **Seeming to be off schedule**
- **Failing to involve participants**
- **Not establishing rapport**
- **Appearing disorganized**
- **Not starting off quickly the image you want (The first impression is a lasting one)**
- **Telling participants your problems**

Course Review

ULM Certification



Final Exam